JVC

SERVICE MANUAL

Hi-Fi STEREO VIDEO CASSETTE RECORDER VHS

HR-D865U

Regarding service information other than these sections, refer to the HR-D870U service manual (No. 82170). Also, be sure to note important safety precautions provided in the service manual.

SPECIFICATIONS

GENERAL

Power requirement : AC 120 V∿, 60 Hz
Power consumption : 23 W
Temperature
  Operating : 5°C to 40°C (41°F to 104°F)
  Storage : – 20°C to 60°C (– 4°F to 140°F)
Humidity
  Operating : 35% to 80%
  Storage : 5% to 80%
Operating position : Horizontal only
Dimensions (WxHxD) : 435 x 94 x 323 mm (17-3/16" x 3-3/4" x 12-3/4")
Weight : 5.3 kg (11.7 lbs)
Format : VHS NTSC standard
Tape width : 12.65 mm
Tape speed (SP) : 33.35 mm/sec (1-5/16 ips)
  (EP) : 11.12 mm/sec (7/16 ips)
Maximum recording time (SP) : 160 min. with T-160 video cassette
  (EP) : 480 min. with T-160 video cassette

VIDEO

Signal system : NTSC-type color signal and EIA monochrome signal, 525 lines/60 fields
Recording system : Rotary two-head helical scan system with slant double-azimuth combination video heads
Input : 0.5 to 2.0 Vp-p, 75 ohms, unbalanced
Output : 1.0 Vp-p, 75 ohms, unbalanced
Signal-to-noise ratio : 45 dB (Rohde & Schwarz noise meter) with PICTURE SHARPNESS control at center position
Horizontal resolution : 240 lines

AUDIO

Input : – 8 dBs, more than 50 k-ohms, unbalanced
Output : – 6 dBs, less than 1 k-ohm, unbalanced (100 k-ohms, load)

NORMAL AUDIO

Recording system : Longitudinal track
No. of audio channels : 1 normal audio channel
Frequency response : 70 Hz to 10,000 Hz

HI-FI AUDIO

Recording system : Deep-layer recording system conforming to stereo Hi-Fi VHS standard
No. of audio channels : 2 Hi-Fi audio channels
Frequency response : 20 Hz to 20,000 Hz
Dynamic range : More than 90 dB
Wow and flutter : Less than 0.005% WRMS

TUNER

Tuning system : Frequency synthesized tuner
Channel coverage
  (VHF) : Channels 2 – 13
  (UHF) : Channels 14 – 69
  (CATV) : 113 Channels
RF output : Channel 3, 4 or OFF (switchable; preset to Channel 3 when shipped) 75 ohms, unbalanced

TIMER

Clock reference : AC line
Program capacity : 1-month programmable timer/ 8-programs
Memory backup time : 10 sec.

ACCESSORIES

Provided accessories : Antenna cable (F-type), Infrared remote control unit, "AA" battery x 2

E. & O.E. Specifications shown are for SP mode unless otherwise specified.
Design and specifications subject to change without notice.

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No. 82204
August 1990

TE: For technical description, please refer to Technical Guide VTG82055 HR-D780/D860/D870 NTSC.

TABLE OF CONTENTS

Important Safety Precautions

4. EXPLODED VIEWS AND PARTS LIST

4.1 PACKING ASSEMBLY <M1> .... 4 - 1
4.2 CABINET ASSEMBLY <M2> .... 4 - 2
4.5 REMOTE CONTROL UNIT <M5> .... 4 - 6

The following table lists the differing points between models (HR-D870U and HR-D865U) in this series.

Model Item	HR-D870U (4 HEADS)	HR-D865U (4 HEADS)
MAIN BOARD ASSY	PB10380A-02	PB10380E
TIMER/DISPLAY/SW BOARD ASSY	PB10380A2-02	PB10380E2
T/D/S BOARD ASSY, IC (MCU), <IC701>	HD404729RY03S	HD404729RY12S
MATCHING TRANSFORMER	PU35613-2	NOT USED
PIN CORD ASSY	PU56142-3	NOT USED
PIN JACK CABLE	PU59205-3	NOT USED
REMOTE CONTROLLER	PQ10956A	PQ10884U

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION:

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

SAFETY PRECAUTIONS

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

This videocassette recorder should be used with AC 120/220V~, 50/60 Hz

NOTE TO CATV SYSTEM INSTALLER:

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

POWER SYSTEM:

This set operates on voltage of either 120 or 220V, 50/60 Hz with automatic switching.

CAUTION:

TO PREVENT ELECTRIC SHOCK DO NOT USE THIS POLARIZED PLUG WITH AN EXTENSION CORD RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

NOTES:

- This set operates on voltage of either 120 or 220V, 50/60 Hz with automatic switching.
- Disconnect the main plug from the supply socket when not in use.
- The rating plate and the safety caution are on the side and rear of the unit.
- Cassettes marked "VHS" (or "S-VHS") can be used with this videocassette recorder.
- HQ VHS is compatible with existing VHS equipment.

VHS HQ

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Printed in Japan

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
Replace only with specified part numbers.
Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
Caution for continued protection against fire hazard.
Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

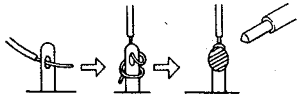


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

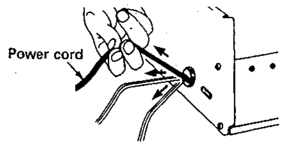


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
   1) **Connector part number :** E03830-001
   2) **Required tool :** Connector crimping tool of the proper type which will not damage insulated parts.
   3) **Replacement procedure**
      (1) Remove the old connector by cutting the wires at a point close to the connector.
      Important : Do not reuse a connector (discard it).

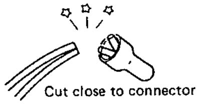


Fig. 3

      (2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

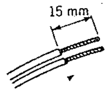


Fig. 4

      (3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

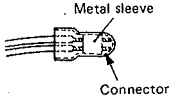


Fig. 5

      (4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

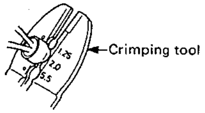


Fig. 6

      (5) Check the four points noted in Fig. 7.

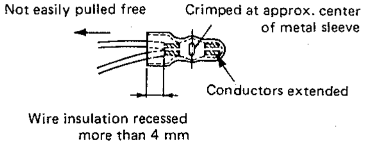

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

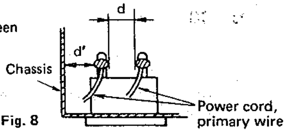


Fig. 8

4. **Leakage current test**
Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
Measuring Method: (Power ON)
Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

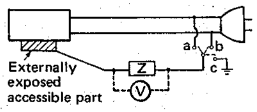


Fig. 9

5. **Grounding (Class I model only)**
Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
Measuring Method:
Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

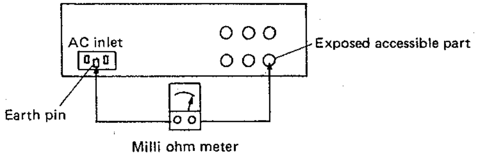


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	—	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

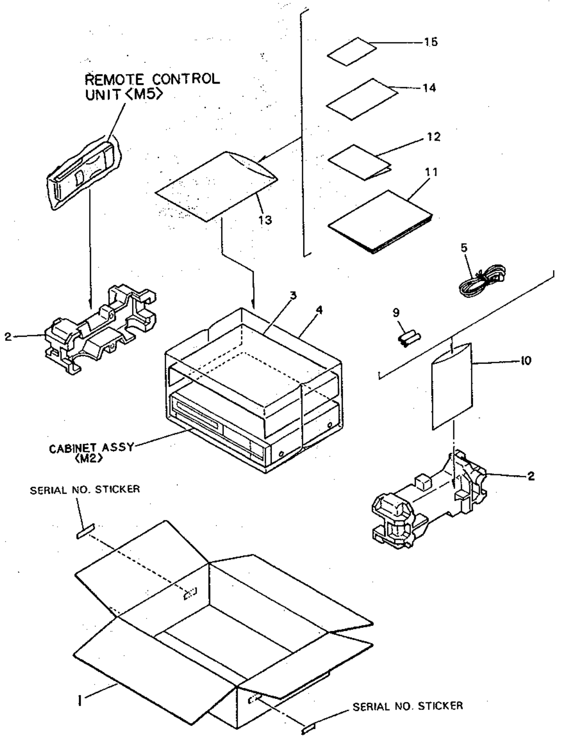
Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION 4
EXPLODED VIEWS AND PARTS LIST

4.1 PACKING ASSEMBLY <M1>

SAFETY PRECAUTION
Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

NOTE: <M > indicates mechanical symbol number.



⚠	REF. No.	PART No.	PART NAME, DESCRIPTION

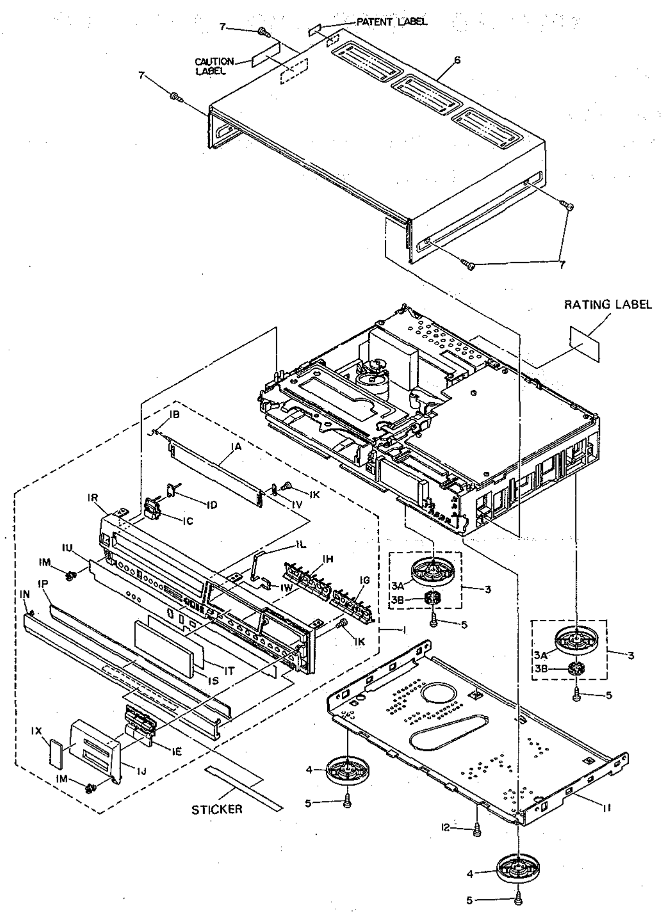
****

PACKING ASSEMBLY <M1>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ33184-30	PACKING CASE
	2	PQ33096A-2	CUSHION ASSY
	3	PQ41026-24	PROTECT SHEET
	4	PQM30021-59-11	POLY BAG
	5	PU59168-2	RF CABLE
		or PU59167-2	RF CABLE

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	9	UM-3DJ2P	BATTERY,X2,cells
	10	QPGA020-02005	POLY BAG
⚠	11	PU30425-1179	INSTRUCTIONS
	12	TCU-3492	TAPE CATALOG
	13	QPGA025-03505	POLY BAG
	14	BT-20046E	TOLL FREE CARD
	15	BT-20062B	WARRANTY CARD

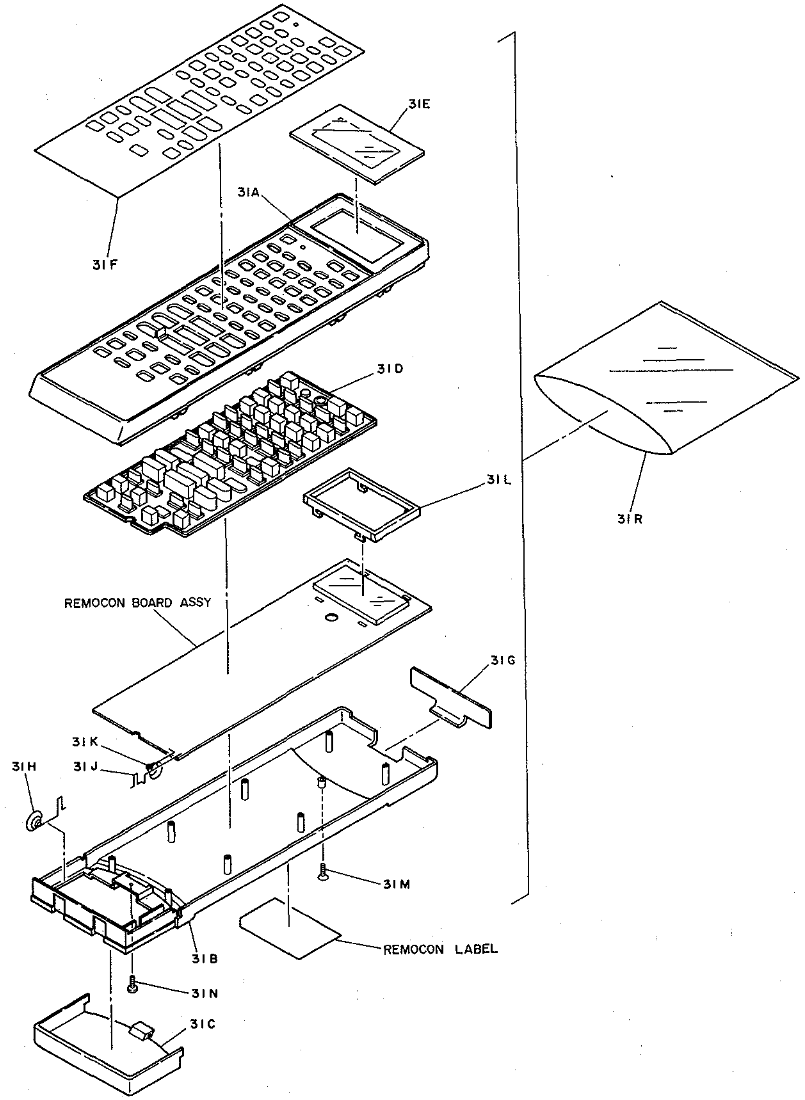
4.2 CABINET ASSEMBLY <M2>


7
PATENT LABEL
CAUTION LABEL
6
7
7
RATING LABEL
IB
IA
IR
ID
IC
IV
IK
IL
IU
IM
IH
IP
IN
IW
IG
3A
3B
3
5
I
IK
IT
IS
IX
IE
IJ
IM
STICKER
3A
3B
3
5
4
5
12
11
4
5

CABINET ASSEMBLY <M2>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ10874N	FRONT PANEL ASSY
	1A	PQ20858-3	CASSETTE HOUSING DOOR
	1B	PQ43628-1-1	TORSION SPRING
	1C	PQ32948-3	BUTTON(POWER)
	1D	PQ32955	INDICATOR(POWER)
	1E	PQ20987-2-2	BUTTON(OPE)
	1G	PQ20856-2-3	BUTTON(1)
	1H	PQ20857-2-2	BUTTON(2)
	1J	PQ20988-2-1	COVER(FRONT)
	1K	SDSF2005Z	SCREW,X2,FOR COVER/CASS DOOR
	1L	PQ32964	EARTH PLATE
	1M	PU60109	CATCHER,X2
	1N	PQ10879-12	DOOR
	1P	PQ20855-3	PLATE(DOOR)
⚠	1R	PQ10875-4-9	FRONT PANEL
	1S	PQ32949-1-2	DISPLAY WINDOW
	1T	PQ32950-3	FILTER
	1U	PQ20859-3	PLATE(PLOG.)
	1V	PQ44389	BRACKET
	1W	PQ44563	BRACKET
	1X	PQ44586	WINDOW
	3	PQ33012B	FOOT ASSY,X2
	3A	PQ33013-2	FOOT(1),X2
	3B	PQ33014	FOOT(2),X2
	4	PQ33013-2	FOOT(1),X2
	5	SDSF3010Z	SCREW,X4,FOR FOOT
⚠	6	PQ10877-6	TOP COVER
	7	PQ43827	SPECIAL SCREW,X4,FOR TOP COVER
⚠	11	PQ10878	BOTTOM COVER
	12	SDSF3010Z	SCREW,FOR BOTTOM COVER

4.5 REMOTE CONTROL ASSEMBLY <M5>


31E
31A
31F
31D
31L
31R
REMOCON BOARD ASSY
31G
31K
31H
31J
31M
31B
REMOCON LABEL
31N
31C

5. REMOTE CONTROLLER ⟨M5⟩

#⚠	REF No.	PART No.	PART NAME, DESCRIPTION
⚠	31	PQ10884U	REMOTE CONTROLLER
	31A	PQ20861	COVER (FRONT)
	31B	PQ20862	COVER (REAR)
	31C	PQ32956	BATTERY CAP
	31D	PQ20863-14	BUTTON
	31E	PQ44010	PLATE (1)
	31F	PQ32922-17	PLATE (2)
	31G	PQ32957	WINDOW (IR)
	31H	PQ44008	TERMINAL (A)
	31J	PQ44023	TERMINAL (B)
	31K	PQ44024	TERMINAL (C)
	31L	PQ44009-2	LCD HOLDER
	31M	SSSF2010M	SCREW
	31N	SPSJ2006M	SCREW
	31R	QPGA012-03005	POLY BAG

NOTE: For technical description, please refer to Technical Guide VTG82055 HR-D780/D860/D870 NTSC

TABLE OF CONTENTS

Section Title Page

Important Safety Precaution

INSTRUCTIONS

1. DISASSEMBLY AND MECHANISM ADJUSTMENTS

1.1 DISASSEMBLY 1-1
1.2 MECHANISM ADJUSTMENTS 1-5
1.3 MAIN MECHANISM PARTS 1-6
1.4 INSPECTION AND MAINTENANCE 1-8
1.5 MAIN PARTS REMOVAL AND REPLACEMENT 1-9

2. ELECTRICAL ADJUSTMENTS

2.1 PREPARATION 2-1
2.2 SWITCHING REGULATOR CIRCUIT 2-3
2.3 SERVO CIRCUIT 2-4
2.4 VIDEO CIRCUIT 2-5
2.5 AUDIO CIRCUIT 2-6
2.6 TIMER CIRCUIT 2-7
2.7 ON SCREEN CIRCUIT 2-7
2.8 TUNER/IF CIRCUIT 2-8

3. CHARTS AND DIAGRAMS

3.1 CIRCUIT BOARD LOCATION 3-1
3.2 GENERAL INFORMATION 3-2
3.3 KEY TO ABBREVIATIONS 3-5
3.4 MAIN TYPES OF ACTIVE AND PACKAGE CIRCUIT 3-7
3.5 BOARD INTERCONNECTIONS 3-9
3.6 POWER SYSTEM BLOCK DIAGRAM 3-11
3.7 SWITCHING REGULATOR BLOCK DIAGRAM 3-13
3.8 SYSTEM CONTROL BLOCK DIAGRAM 3-15
3.9 VIDEO BLOCK DIAGRAM 3-17
3.10 PRE/REC BLOCK DIAGRAM 3-19
3.11 SERVO BLOCK DIAGRAM 3-21
3.12 AUDIO BLOCK DIAGRAM 3-23
3.13 IF TUNER CONTROL AND DEMODULATOR BLOCK DIAGRAMS 3-25
3.14 TIMER/DISPLAY/SWITCH AND SWITCH/JACK BLOCK DIAGRAMS 3-27
3.15 SWITCHING REGULATOR SCHEMATIC DIAGRAM 3-29
3.16 SWITCHING REGULATOR CIRCUIT BOARD 3-31
3.17 VIDEO SCHEMATIC DIAGRAM 3-33
3.18 VIDEO CIRCUIT BOARD 3-36
3.19 AUDIO UNIT SCHEMATIC DIAGRAM 3-37
3.20 AUDIO UNIT AND DEMODULATOR CIRCUIT BOARDS 3-39
3.21 TUNER/IF SCHEMATIC DIAGRAMS 3-41
3.22 DEMODULATOR SCHEMATIC DIAGRAM 3-43
3.23 SERVO AND AUTO TRACKING SCHEMATIC DIAGRAMS 3-45
3.24 AUTO TRACKING CIRCUIT BOARD 3-48
3.25 SYSTEM CONTROL SCHEMATIC DIAGRAM 3-49
3.26 DECK TERMINAL, LOADING MDA, CASS. HOUSING AND CAPSTAN MDA SCHEMATIC DIAGRAMS 3-51
3.27 DECK TERMINAL, LOADING, MDA, A/CTL HEAD AND CASS. HOUSING CIRCUIT BOARDS 3-52
3.28 MAIN CIRCUIT BOARD 3-53
3.29 ON SCREEN SCHEMATIC DIAGRAM 3-55
3.30 ON SCREEN CIRCUIT BOARD 3-57
3.31 TIMER/DISPLAY/SWITCH AND SWITCH/JACK SCHEMATIC DIAGRAMS 3-59
3.32 TIMER DISPLAY/SWITCH AND SWITCH/JACK CIRCUIT BOARD 3-61
3.33 PRE/REC SCHEMATIC DIAGRAM 3-63
3.34 PRE/REC CIRCUIT BOARD 3-65
3.35 REMOTE CONTROL SCHEMATIC DIAGRAM 3-67
3.36 RF CONVERTER/SWITCH SCHEMATIC DIAGRAM 3-68

4. EXPLODED VIEWS AND PARTS LIST

4.1 PACKING ASSEMBLY <M1> 4-1
4.2 CABINET ASSEMBLY <M2> 4-2
4.3 CHASSIS ASSEMBLY <M3> 4-3
4.4 MECHANISM ASSEMBLY <M4> 4-4
4.5 REMOTE CONTROL UNIT <M5> 4-6

5. ELECTRICAL PARTS LIST

SWITCHING REG BOARD ASSEMBLY <01> 5-1
MAIN BOARD ASSEMBLY <03> 5-2
VIDEO UNIT BOARD ASSEMBLY <05> 5-7
AUDIO UNIT BOARD ASSEMBLY <09> 5-9
AUDIO CONTROL HEAD BOARD <12> 5-11
DEMODULATOR BOARD ASSEMBLY <14> 5-11
ON SCREEN BOARD ASSEMBLY <17> 5-11
TIMER/DISPLAY/SWITCH BOARD ASSEMBLY <21> 5-12
SW/JACK BOARD ASSEMBLY <37> 5-14
UPPER DRUM BOARD <41> 5-14
PRE/REC BOARD ASSEMBLY <43> 5-14
DECK TERMINAL BOARD ASSEMBLY <51> 5-15
LOADING MDA BOARD ASSEMBLY <55> 5-16
CASSETTE HOUSING BOARD ASSEMBLY <56> 5-16
AUTO TRACKING BOARD ASSEMBLY <83> 5-16

6. TECHNICAL INFORMATIONS

6.1 SYSTEM CONTROL CIRCUIT 6-1

Important Safety Precautions

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   3) Spacers
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   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

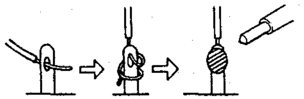


Fig. 1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10–15 kg of force in any direction will not loosen it.

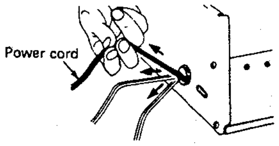


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

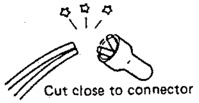


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

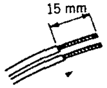


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

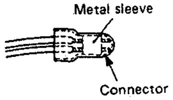


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

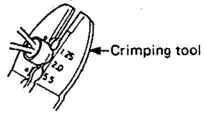


Fig. 6

(5) Check the four points noted in Fig. 7.

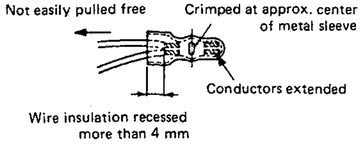
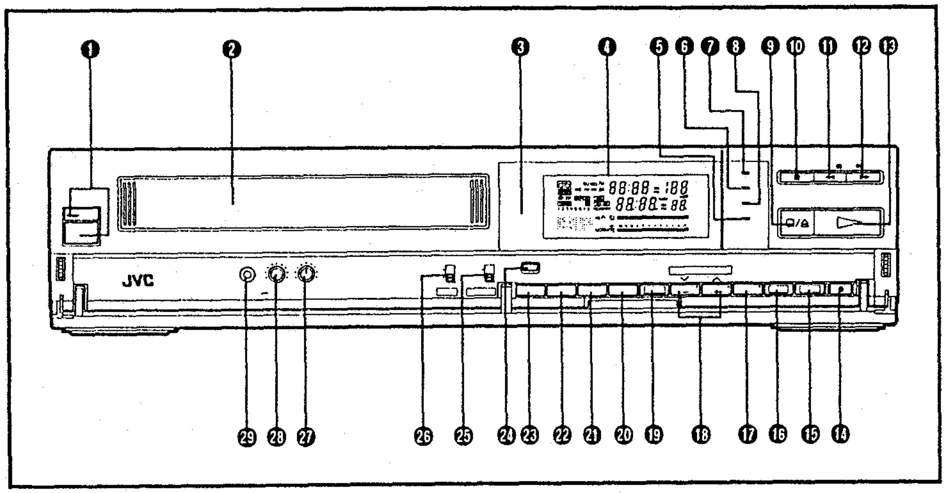

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

CONTROLS, INDICATORS AND CONNECTORS

Refer to the "REMOTE CONTROL UNIT" section for a description of functions of the same controls that are provided on both the VCR and the remote control unit.

FRONT PANEL



① **POWER button with LED indicator**
Loading a cassette also turns on the power.

② **Cassette loading slot**

③ **Infrared beam receiving window**

④ **Display Panel**
See page 12.

⑤ **DIGITAL AV TRACKING indicator**
Lights in the Digital AV Tracking mode. Blinks while adjusting.(See page 22.)

⑥ **SAP indicator**
Lights when a TV program accompanied by a second audio program is being received.

⑦ **STEREO indicator**
Lights when a stereo program is being received.

⑧ **SAP REC indicator**
Lights when "2ND AUDIO" on the VCR SETUP menu is set for "ON".

⑨ **STOP/EJECT button**
- Press while in the Stop mode to eject the cassette.
- Press while in other modes to stop the tape.

⑩ **PAUSE/STILL button**

⑪ **REW (Rewind) button**

⑫ **FF (Fast Forward) button**

⑬ **PLAY button**

⑭ **REC/ITR button**
- Press once to start recording.
- Press again for instant timer recording. (See page 28.)
- Also use to set the required recording time in the 24-Hour Instant Timer Set mode. (See page 28.)

⑮ **START button**
To engage the 24-Hour Instant Timer Set mode. (See page 28.)

⑯ **TIMER button**

⑰ **SELECT button**

⑱ **CHANNEL (∨/∧) /SET/TRACKING/V.LOCK buttons (–/+)**
- Function the same as the remote control's CHANNEL button ㊳ for up/down channel scan tuning.
- Function the same as the remote control's SET buttons for on-screen menu operations.
- Press these buttons simultaneously to cancel automatic Digital AV Tracking during playback. (See page 22.)
- To eliminate vertical vibrations of the picture if observed in the Still mode. (See page 24.)

⑲ **MENU button**

⑳ **C.MEMORY/ADD/REPEAT button**

㉑ **C.RESET/SKIP/CANCEL button**

㉒ **COUNTER/REMAIN/DATE button**
To switch the display panel between the counter, remaining tape time and date modes.

㉓ **SP/EP button**

㉔ **TV/VIDEO button**

㉕ **AC ONLINE switch**
OFF position: Power flows through the rear panel AC OUTLET ㊳ regardless of whether the recorder is on or off.
ON position: Power flows only when the recorder is on. When used in combination with the built-in timer, this enables timer-controlled power supply for the connected equipment.

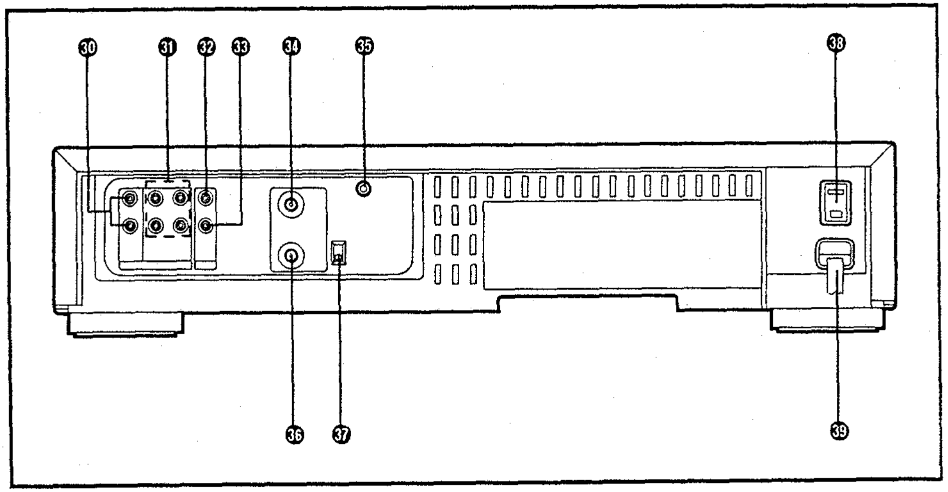
㉖ **EDIT switch**
Normally set to OFF. For making multi-generation dubs, set it to the ON position. (See page 35).

㉗ **PICTURE SHARPNESS control**
Turn for softer or sharper playback picture.

㉘ **PHONES VOLUME control**
Adjusts the level of the audio output from the headphone jack ㉙.

㉙ **PHONES jack**
Connect a set of headphones for monitoring or private listening.

REAR PANEL



㉚ **AUDIO IN connectors**
Connect to the AUDIO OUT connectors of another video recorder or the A/V OUT connector of a VideoMovie for tape-to-tape transfer.

㉛ **AUDIO OUT 1/2 connectors**
Two pairs of AUDIO OUT connectors allow simultaneous connection of a stereo television and an audio amplifier for playback.

㉜ **VIDEO IN connector**
Connect to the VIDEO OUT connector of another video recorder or the A/V OUT connector of a VideoMovie for tape-to-tape transfer.

㉝ **VIDEO OUT connector**
Connect to the VIDEO IN connector of another video recorder for tape-to-tape transfer, or the VIDEO IN connector of a television for playback.

㉞ **ANT. IN terminal**
Connect an antenna cable or a cable TV line. If necessary, use the matching transformer (provided).

㉟ **REMOTE PAUSE terminal**
- When editing from a JVC VideoMovie equipped with the Master Edit Control system, connect the remote control cable of the VideoMovie to this terminal to enable control of the tape with the VideoMovie's controls.
- When editing to a JVC video deck equipped with a PAUSE OUT terminal, connect that terminal to this terminal to enable synchronized preroll editing.

㊱ **RF OUT terminal**
Connect to the all-channel antenna connector (female F) of your television using the provided antenna cable.

㊲ **RF output channel select switch**
See "VIDEO CHANNEL SETTING" on page 14.

㊳ **AC OUTLET**
Supplies power to external equipment requiring less than 300 W. Functions as a SWITCHED outlet when the AC ONLINE switch ㉕ is set to ON.

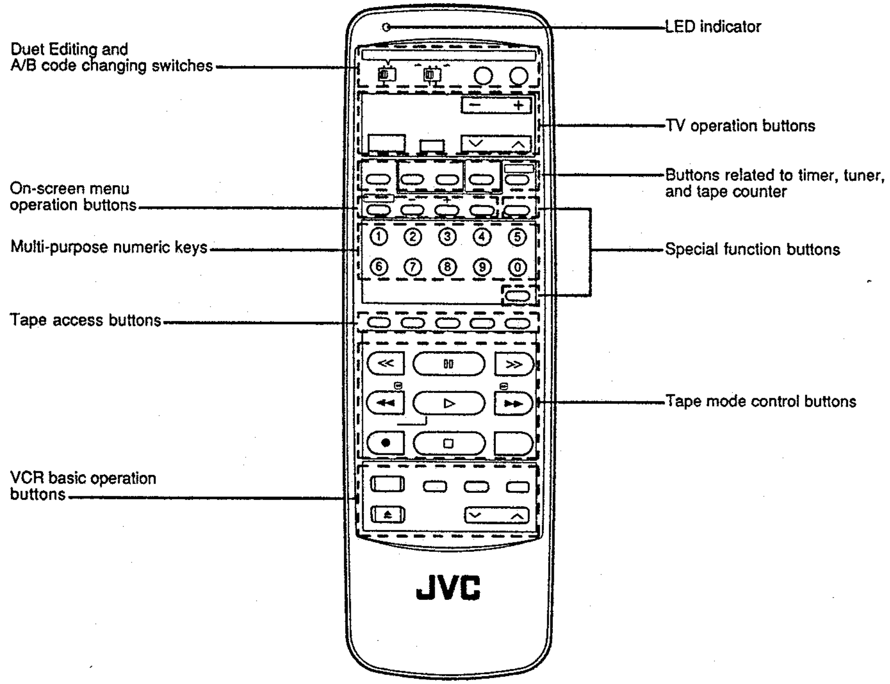
㊴ **Power cord**

REMOTE CONTROL UNIT

FROM TAPE CONTROL TO TIMER PROGRAMMING

The provided remote control unit is capable of controlling all VCR functions except instant off-timer recording, instant 24-hour timer recording, picture sharpness adjustment, manual tracking control, and V-lock control. And also, it is provided with 10 numeric keys and TV control buttons. So, after loading a cassette, sit back and use your remote control. You don't have to refer to the VCR's display panel because all necessary indications appear on the TV screen.

- Operation instructions in this manual generally refer to the remote control unit.
- If you are not using the remote control, operate the corresponding buttons on the VCR.
- The maximum operating distance of the remote control is about 8 m (26 ft).

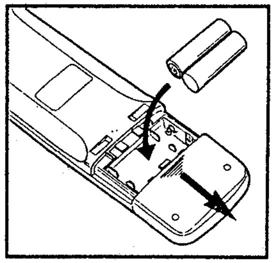


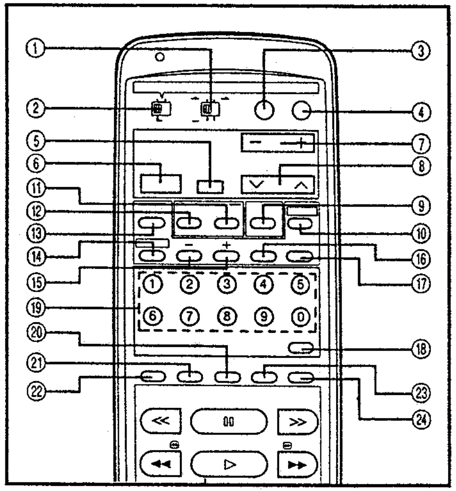
PRECAUTIONS

- Avoid violent shocks, especially take care not to drop the unit.
- Take care not to allow liquid to spill into the unit or dampen the terminals.
- Do not place heavy objects on the unit.
- Avoid leaving the unit in places subject to direct sunlight or extremely high temperatures.

INSTALLING THE BATTERIES

1. Slide the battery compartment cover on the rear of the unit in the direction of the arrow (▼).
2. Insert 2 "AA"-size batteries (provided) in the correct directions into the battery compartment.
3. Replace the cover.





CONTROL BUTTONS: WHEN TO USE

A/B code changing and Duet Editing switches

① **RCU CODE A/B switch.**
- When operating two JVC video decks, use this switch to specify the remote control's code mode.(See page 11.)
- When performing Duet Editing, use this switch to specify the direction of signal flow. (See page 35.)

② **DUET EDITING ON/OFF switch**
This switch operates in conjunction with the RCU CODE A/B switch ①.
- Normally leave this switch set to OFF. When set to OFF, the remote control unit's A/B code can be changed with the RCU CODE A/B switch ①. (See page 11.)
- Set to ON only to engage the Duet Editing mode between two decks. (See page 35.)

③ **DUET EDITING STANDBY button**
Press in the Duet Editing mode to engage the player deck in the Still mode and the recorder deck in the Record mode.

④ **DUET EDITING START button**
Press in the Duet Editing mode to start editing between the two decks.

TV Operation Buttons (designated TV models only)

⑤ **MONITOR TV/VIDEO button**
To select the TV's operating mode.
TV: For viewing broadcast programs or tape programs via RF connection.
VIDEO: For viewing programs via AV connection.

⑥ **POWER (TV) button**
To turn the TV power on or off.

⑦ **VOLUME –/+ buttons**
To decrease or increase the TV's sound volume.

⑧ **CHANNEL ∨/∧ buttons**
To select a desired channel on the TV receiver.

Buttons Related to Timer, Tuner, and Tape Counter

⑨ **DISPLAY button**
To obtain a 5-second on-screen counter reading in hours, minutes and seconds, or remaining tape time reading in hours and minutes.

⑩ **TIMER button**
To engage the Timer Standby mode.

⑪ **COUNTER RESET**
To reset the Realtime Counter display to "0H 00M 00S".

⑫ **COUNTER MEMORY/REPEAT button**
- To engage the Counter Memory mode; M will appear on the display panel and the tape will automatically stop at the counter reading of "0H 00M 00S" when it is being fast-forwarded or rewound.
- To enter the repeat command in timer programming.

⑬ **CANCEL/SKIP button**
- To clear the preset timer data during timer programming.
- To remove unwanted channels during manual channel setting.

On-screen Menu Operation Buttons

⑭ **MENU button**
To call up the on-screen menu. (See pages 17.)

⑮ **SET –/+ buttons**
To adjust data or move the cursor during on-screen setting operations .

⑯ **SELECT button**
To verify entry and proceed to the next step during on-screen setting operations.

Special Function Buttons

⑰ **SP/EP select button**
To select the recording speed (Standard Play or Extended Play).

⑱ **ENTER/ADD button**
- To obtain a 5-second on-screen mode check display.
- To store a channel during manual channel setting.
- To instantly tune in the channel selected with 10-key input.

⑲ **Multi-Purpose Numeric Keys**
Ordinarily to select a desired channel. To change channels instantly, press the ENTER button immediately after pressing the numeric keys. "0" can be used for setting to the AUX mode.
On-screen menu: See pages 17 – 20 and 29 – 31.
Realtime Go-To: See page 32.
Index Search: See page 33.

Tape Access Buttons

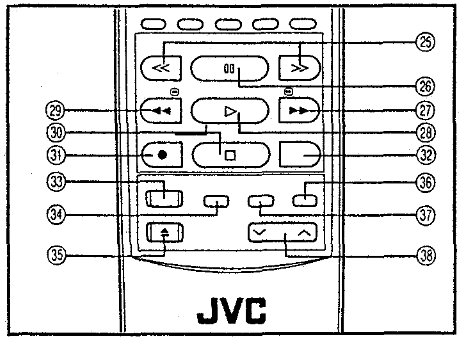
⑳ **INDEX button**
To engage the Index Search mode. (See page 33.)

㉑ **ERASE button**
While in the Play mode, press to erase an unnecessary index code.

㉒ **MARK button**
While in the Record or Play mode, press to put an additional index code on the tape.

㉓ **GO-TO button**
To engage the Realtime Go-To mode. (See page 32.)

㉔ **INTRO button**
To engage the Intro Search mode. (See page 33.)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JVC

Tape Mode Control Buttons

㉕ **VARIABLE SEARCH buttons**
For slow motion and rapid search at variable speeds. (See page 24.)

㉖ **PAUSE/STILL button**
- Press while in the Record mode to stop the tape temporarily to avoid recording of unwanted material.
- Press while in the Play mode to view a still picture.
- The still picture can be advanced each time this button is pressed.

㉗ **FF button**
- Press while in the Stop mode to fast-forward the tape.
- Press while in the Play mode for Shuttle Search in the forward direction.

㉘ **PLAY button**
- To play back a tape.
- To cancel the Pause/Still and Search mode and resume normal playback.
- To start recording from the Record-Pause mode.

㉙ **REW button**
- Press while in the Stop mode to rewind the tape.
- Press while in the Play mode for Shuttle Search in the reverse direction.

㉚ **STOP button**
To stop the tape.

㉛ **REC button**
Press together with the PLAY button ㉘ to start recording.

㉜ **SKIP/BLANK SEARCH button**
- Press while in the Play mode, to zip through unwanted tape segments. (See page 23.)
- Press in the Stop mode to engage the Blank Search mode. The tape will automatically stop at the beginning of a non-recorded section, and the remaining tape time will be automatically displayed in hours and minutes on the display panel. (See page 26.)

VCR Basic Operation Buttons

㉝ **POWER button**
To turn the recorder's power on or off.

㉞ **TV/VIDEO button**
To select the VCR's operating mode.
TV: For viewing broadcast TV programs.
VIDEO: For viewing tape programs via RF connection.
- If the RF output channel select switch ㊲ on the rear panel is set to OFF, this button has no effect.

㉟ **EJECT button**
To eject the cassette.

㊱ **TV MONITOR button**
Press during tape playback to monitor the TV broadcast being received by the recorder's built-in tuner, or from a connected external video source (in the AUX mode).

㊲ **AUDIO MONITOR button**
Selects the audio track(s) to be output; Hi-Fi, normal or a mixture of both. (See page 16.)

㊳ **CHANNEL ∨/∧ Up/Down button**
For up/down channel scan tuning.

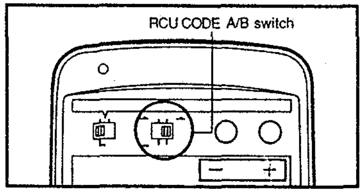
A/B CODE SWITCHING

When you own two JVC video decks, this remote control can operate both decks separately; they will not respond simultaneously to the remote control's signal, if they are set to respond to different codes. Initially this recorder is set in the "A" code mode. Therefore, if the RCU CODE A/B switch is set to "B", this recorder will not respond to remote control commands. If you wish to change the recorder's code mode to "B", follow the instructions below:

(1) Unplug the power cord of the recorder from the AC outlet.
(2) Set the RCU CODE A/B switch to "B". (Make sure that the DUET EDITING ON/OFF switch is set to "OFF".)
(3) Plug the power cord of the recorder into the AC outlet.
(4) Turn on the power of the recorder using the remote control's POWER button ㉝.
The recorder "memorizes" this B code and will respond only to the B code signals. Set the other deck to respond to the A code signals in the same procedure.

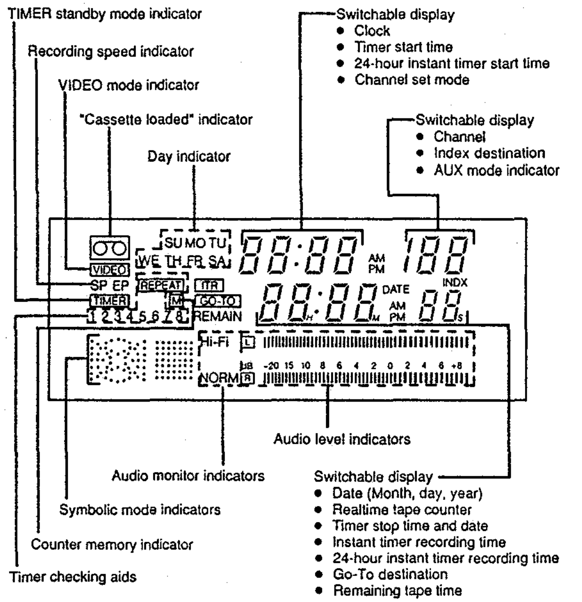
Note:
Do not operate other remote controls after you have plugged the recorder into the AC outlet and before you press the POWER button ㉝ of this remote control.

CAUTION:
Some televisions may malfunction in response to this remote control when used in the "B" mode. If this should happen, switch the mode back to "A".


RCU CODE A/B switch

DISPLAYS FOR VISUAL CHECKS OF RECORDER MODES

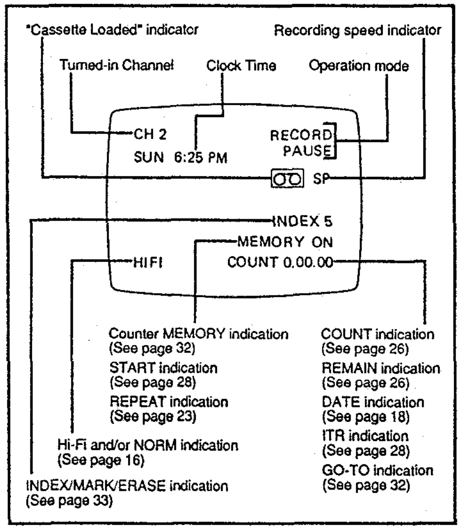
DISPLAY PANEL


TIMER standby mode indicator
Recording speed indicator
VIDEO mode indicator
"Cassette loaded" indicator
Day indicator
Switchable display
• Clock
• Timer start time
• 24-hour instant timer start time
• Channel set mode
Switchable display
• Channel
• Index destination
• AUX mode indicator
VIDEO
SU MO TU
WE TH FR SA
SP EP
REPEAT
ITR
TIMER
M
GO-TO
1 2 3 4 5 6 7 8
REMAIN
AM PM
DATE
INDX
Hi-Fi
NORM
L
R
dB -20 15 10 8 6 4 2 0 2 4 6 +8
Audio level indicators
Audio monitor indicators
Symbolic mode indicators
Counter memory indicator
Timer checking aids
Switchable display
• Date (Month, day, year)
• Realtime tape counter
• Timer stop time and date
• Instant timer recording time
• 24-hour instant timer recording time
• Go-To destination
• Remaining tape time

Symbolic mode indicators

PLAY:	▷
FF:	▷▷
REW:	◁◁
FF VARIABLE SHUTTLE SEARCH:	▷ ▷▷
REW VARIABLE SHUTTLE SEARCH:	◁ ◁◁
STILL:	⏸
FORWARD SLOW:	▷ ⏸
REVERSE SLOW:	◁ ⏸
RECORD:	○
RECORD PAUSE:	○ ⏸

ON-SCREEN DISPLAY


"Cassette Loaded" indicator
Recording speed indicator
Turned-in Channel
Clock Time
Operation mode
CH 2
SUN 6:25 PM
RECORD
PAUSE
SP
INDEX 5
MEMORY ON
HIFI
COUNT 0.00.00
Counter MEMORY indication
(See page 32)
START indication
(See page 28)
REPEAT indication
(See page 23)
Hi-Fi and/or NORM indication
(See page 16)
INDEX/MARK/ERASE indication
(See page 33)
COUNT indication
(See page 26)
REMAIN indication
(See page 26)
DATE indication
(See page 18)
ITR indication
(See page 28)
GO-TO indication
(See page 32)

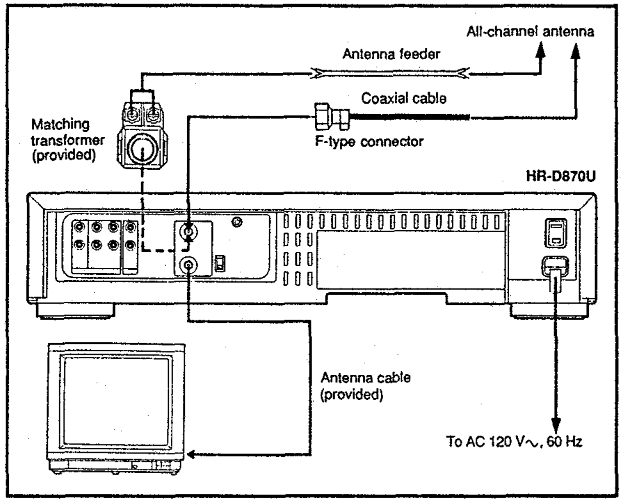
The following display is available when the ON-SCREEN item is set to "ON" on the VCR SET UP menu. (See page 20.)

Automatic indication
- Channel display
  Each time a different channel is selected, the tuned-in channel will be displayed on the screen for 5 seconds. (No channel display is available during tape playback.)
- Operation mode
  Each time the operation mode is changed, the engaged mode is displayed. RECORD (5 sec, together with channel, cassette mark and tape speed), PLAY (5 sec), FF/REW (5 sec, only when engaged from Stop mode), and RECORD PAUSE, (as long as the Pause mode is engaged).
- "Cassette Loaded" mark
  The mark is displayed for 5 seconds when a cassette is inserted, and blinks until the cassette is ejected when the EJECT button is pressed.

Manual recall
- For checking of the mode, press the ENTER button on the remote control. The corresponding indications above will be available on the screen together with the clock time for 5 seconds.
- The manually-called COUNT or REMAIN indication remains on the screen until the ENTER button is pressed again.

CONNECTIONS

TO VHF AND UHF ANTENNAS



Procedure

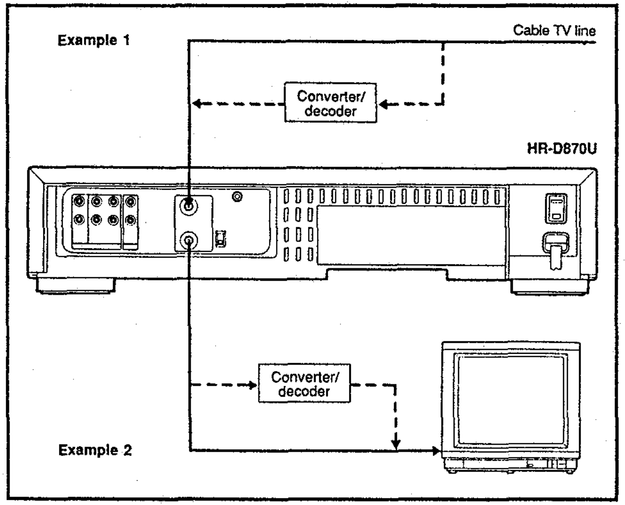
- Remove the antenna cable from the TV receiver and reconnect to the recorder's ANT IN connector as illustrated. The recorder is then ready to record off-air programs.

  Notes:
  - If your antenna cable is a 300-ohm flat feeder, use the provided matching transformer.
  - If your antenna system has separate VHF/UHF lead-in wires, use an antenna mixer and connect its output to the recorder's ANT IN connector, either directly or through the provided matching transformer depending on the type of the mixer.

- Connect the recorder to the TV receiver using the 75-ohm antenna cable (provided).

  Note:
  If your TV is equipped with 300-ohm UHF input terminals and a 75-ohm VHF input terminal, use an antenna splitter to complete connection.

TO A CABLE TV LINE



Note:
If your cable TV system does not require a converter/decoder for scrambled signals, you can use the cable-compatible tuner built into the recorder for viewing and recording. In this case, simply connect the cable TV line to the ANT IN terminal of the recorder and the RF OUT terminal of the recorder to your TV receiver. Please contact your cable TV company for any questions concerning hookups or cable TV operation.

Example 1

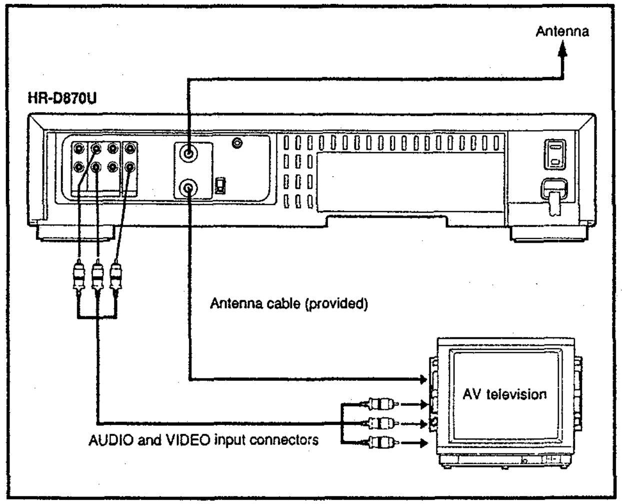
- You can record any scrambled cable TV channel while watching it.
- Select the recording channel on the converter/decoder.
- Set the recorder to the output channel of the converter/decoder (channel 3 or 4).
- Set the TV receiver to channel 3 or 4.
- Set the TV/VIDEO button on the recorder to VIDEO (the VIDEO indicator lights).

Example 2

- You can record any non-scrambled cable TV channel while watching it or any other channel including "scrambled signal" channels.

  Note:
  "Scrambled signal" channels cannot be recorded.
- Select the recording channel on the recorder.
- Select the viewing channel on the converter/decoder.
- Set the TV receiver to the output channel of the converter/decoder (channel 3 or 4).
- Set the TV/VIDEO button as necessary.

TO AN AV TELEVISION



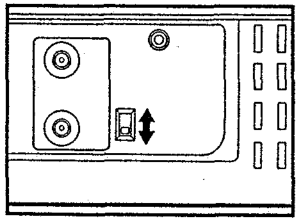
1. Connect the AUDIO OUT 1 or 2 connectors of the video recorder to the AV television's AUDIO IN jacks.
2. Connect the VIDEO OUT connector to the AV television's VIDEO IN jack.
3. Connect the RF OUT terminal to the ANTENNA connector of the AV television.

Note:
With this connection, it is recommended that you set the RF output channel select switch ㊲ to the OFF position. Then the RF OUT terminal always delivers antenna signals directly to the television. To view video recordings, set the television to the AV mode.

VIDEO CHANNEL SETTING

The built-in RF converter permits playback of video and audio recordings through a TV receiver. The signals from the RF converter are viewed through a vacant channel not used for broadcasting in your viewing area.

(Rear)

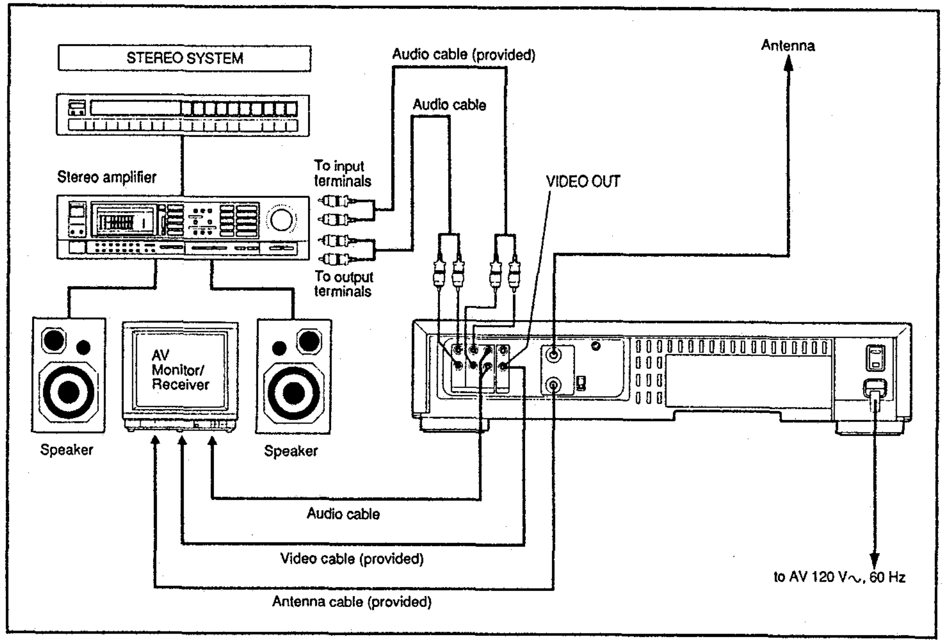


The converter channel of all units is set to 3 prior to shipment from the plant. Reset the channel to 4 in areas where channel 3 is employed for broadcasting. For this purpose, slide the channel select switch on the rear of the unit to CH 4.
This is YOUR video channel. To view video cassettes via RF OUT connection, always set the TV channel selector to either channel 3 or 4.

Notes:
- If the picture is not clear, perform fine tuning on your television.
- If the recorder is connected to a television via its VIDEO OUT and AUDIO OUT connectors, set the RF output channel select switch to OFF. With this setup, the TV/VIDEO button has no effect on the output signal, and the recorder is always in the TV mode, regardless of whether the VIDEO indicator is on or off.

Connection	RF output channel select switch	Signal from RF OUT	TV/VIDEO button	TV's mode
RF OUT + AV	OFF	Direct antenna signal always.	No effect	TV or VIDEO
RF OUT only	CH3 or CH4	Direct antenna signal in TV mode. RF channel 3 or 4 signal in VIDEO mode.	Switching is necessary depending on the intended operation.	TV

TO A STEREO SYSTEM


STEREO SYSTEM
Stereo amplifier
Audio cable (provided)
Audio cable
Antenna
To input terminals
To output terminals
VIDEO OUT
AV Monitor/ Receiver
Speaker
Speaker
Audio cable
Video cable (provided)
Antenna cable (provided)
to AV 120 V∿, 60 Hz

1. Connect the AUDIO OUT-1 or -2 L and R connectors of the HR-D870U to the AUX IN or TAPE MONITOR terminals of the amplifier.
2. Connect the AUDIO IN L and R connectors of the HR-D870U to the recording output terminals of the amplifier. (Exactly as one hooks up an audio cassette deck.)

Application

- If the HR-D870U is connected to both a stereo AV television and a stereo system, you can enjoy prerecorded Hi-Fi VHS tapes in stereo by listening to them either through the stereo system or through the AV television's audio circuitry. (With monaural televisions, use a stereo system to enjoy Hi-Fi stereo video recordings.)
- You can record only audio (without recording any video signal) on both hi-fi and longitudinal audio tracks. This means you can record a continuous 8-hour FM program onto a single cassette (T-160 cassette). See page 27.

CAUTION:

- The HR-D870U has a dynamic range of more than 90 dB with regards to its hi-fi audio capability. It is recommended that you check the maximum level if you are going to listen to the hi-fi audio signals through a stereo amplifier. A sudden surge in speaker input may cause speaker damage.
- Some speakers and televisions are specially shielded to prevent television interference. If both are of the non-shielded type, do not place the speakers adjacent to the TV set, otherwise the video playback picture will not be normal because of mutual interference.

Note:
When a video tape is played back through the RF OUT connector, the audio is reproduced always as monaural; with hi-fi stereo tapes, both channels are mixed.

INFORMATION ON THE HR-D870U'S AUDIO SYSTEM

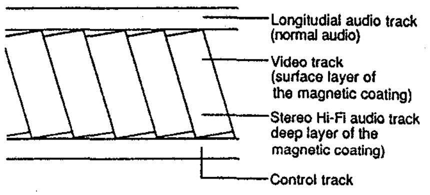
HI-FI AND NORMAL AUDIO

The HR-D870U has two audio systems: Hi-Fi audio and normal audio. Hi-Fi audio signals (2-channel) are recorded deep into the tape's magnetic coating of the video track section, while normal audio signals are recorded on the usual longitudinal audio track.

CAUTION:

- The Hi-Fi soundtrack cannot be reproduced with video equipment other than Hi-Fi VHS.
- The normal soundtrack is compatible with any VHS equipment.

Tape pattern recorded with the HR-D870U
The Hi-Fi and normal soundtracks are recorded simultaneously.


Longitudial audio track (normal audio)
Video track (surface layer of the magnetic coating)
Stereo Hi-Fi audio track deep layer of the magnetic coating)
Control track

MTS (Multichannel Television Sound) COMPATIBILITY

Stereo and SAP (Second Audio Program) programs can be recorded; stereo on the Hi-Fi audio track, and SAP on the normal audio track. SAP recording can be defeated by setting "2ND AUDIO" on the on-screen VCR SET UP menu to "OFF". (See page 20.)

Recording options according to the type of broadcasts and 2ND AUD setting

Type of broadcast (indicated by SAP and STEREO indicators ❻ ❼)	On-screen menu 2ND AUDIO setting (indicated by SAP REC indicator ❽)	Audio track		
		Normal audio (mono)	Hi-Fi audio	
			L	R
Regular broadcast	Either OFF or ON	Mono	Mono	Mono
Regular + SAP (SAP: ON)	OFF	Main	Main (mono)	Main (mono)
	ON	SAP	Main (mono)	Main (mono)
Stereo + SAP (STEREO: ON, SAP: ON)	OFF	L+R mixed	Stereo	
	ON	SAP	Stereo	
Stereo broadcast (STEREO: ON)	Either OFF or ON	L+R mixed	Stereo	

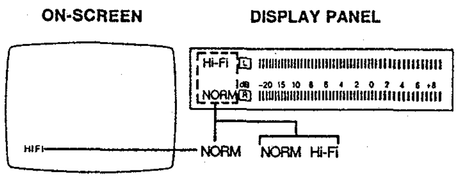
Note:

- Off-air MTS programs are received in accordance with the Broadcast Television Systems Committee (BTSC) standard. The method of transmission of stereo programs via cable varies from area to area and may not be compatible with the BTSC standard. Consult your local cable company for compatibility in your area.

DUAL-AUDIO PLAYBACK FLEXIBILITY

The AUDIO MONITOR button ㊲ on the remote control selects Hi-Fi, normal, or a mixture of the two for listening. The corresponding audio select indicator appears on the screen and the display panel ("Hi-Fi", "NORM", or both for mixed playback).

- Set to Hi-Fi to listen to the Hi-Fi soundtrack.
- Set to NORM to listen to the normal soundtrack.
- Set to Hi-Fi/NORM to listen to both.


ON-SCREEN
DISPLAY PANEL
HIFI
Hi-Fi
L
dB -20 15 10 8 6 4 2 0 2 4 6 +8
NORM
R
NORM
NORM Hi-Fi

Notes:

- This button functions during recording as well, although it has no effect on the recorded signal.
- When a tape with normal audio only is played back, the NORM mode is automatically selected.

ON-SCREEN MENU SYSTEM

WHAT'S ON THE MENU?

In addition to timer programming, most setup procedures are simplified with the on-screen menu system. Available menus are:

1. TODAY'S PROGRAM — to program the timer to record TV programs which start within 24 hours.
2. PROGRAM — to program the timer to record TV programs which start at any time after 24 hours and within one month.
3. CLOCK SET — to initially set the clock, or readjust it.
4. VCR SET UP — to make basic recorder settings.
5. TUNER SET UP — to preset tuner channels.
   - Before using the recorder, be sure to set the clock.

ATTENTION

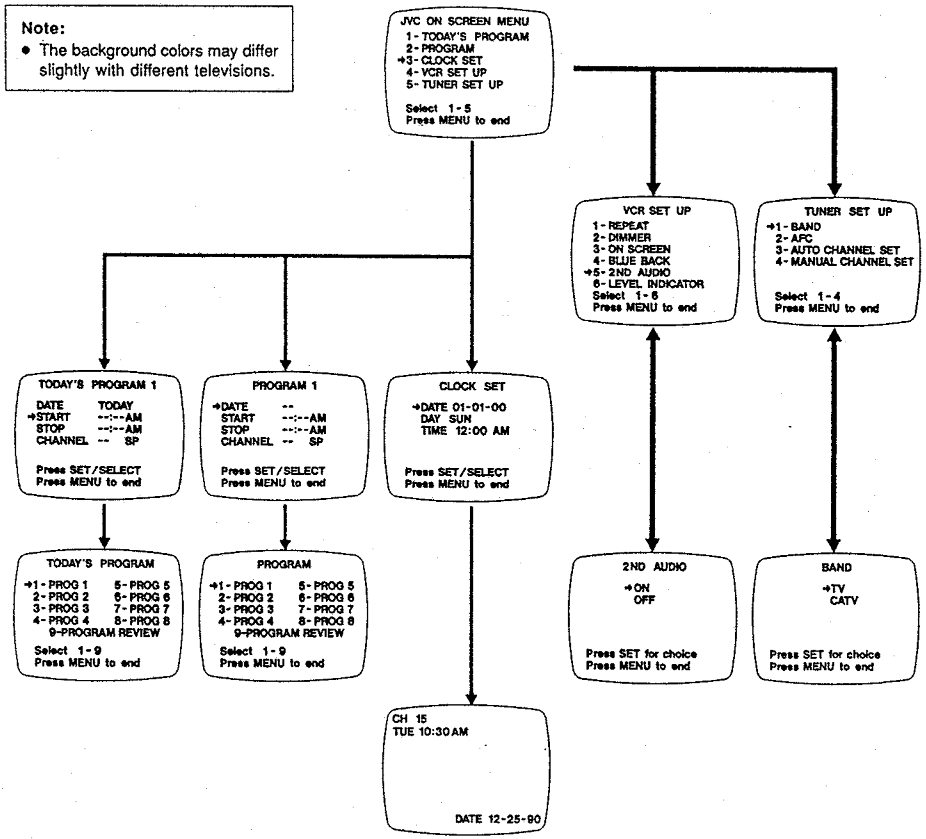
- Before use: in order to record TV programs correctly, be sure to preset tuner channels to suit your area, using the full-auto on-screen tuner setting menu.

Note:

- The background colors may differ slightly with different televisions.

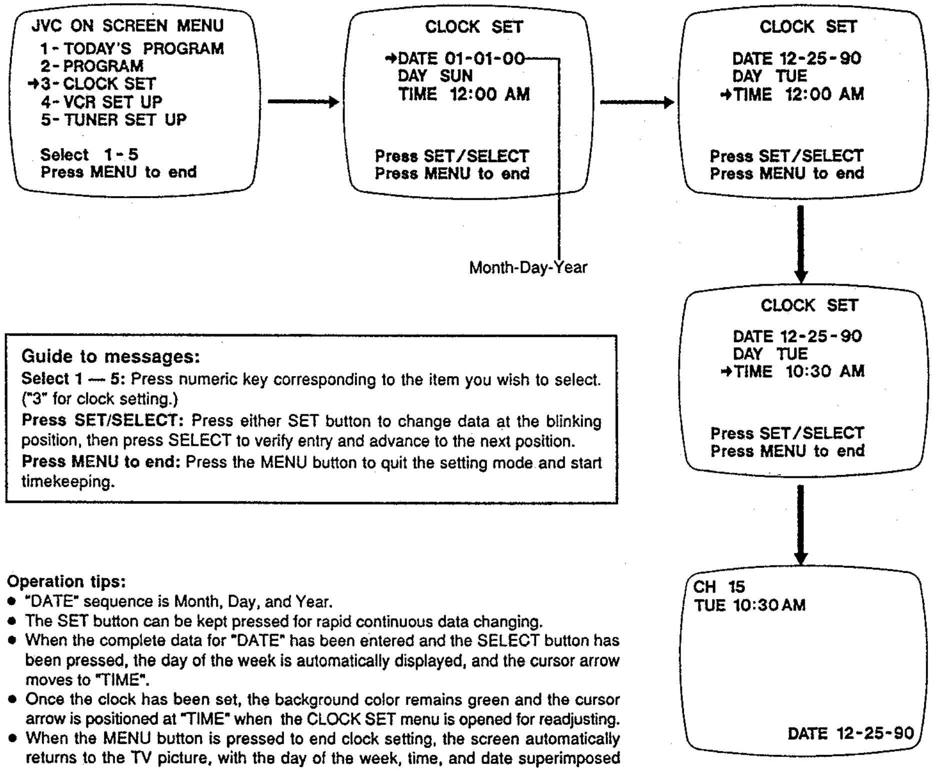
TO GET THE ON-SCREEN MENU

- Turn on the recorder and television, and set them correctly. (Set the recorder to the VIDEO mode for RF OUT connection, or set the television to the AV mode for AV connection. See page 14.)
  Press the MENU button. Then follow the on-screen messages.
- The changing background colors are also helpful in confirming the settings.
- For more details of each setting procedure, refer to the following pages:
  1. TODAY'S PROGRAM — page 29
  2. PROGRAM — page 30
  3. CLOCK SET — page 18
  4. VCR SET UP — page 20
  5. TUNER SET UP — page 19


JVC ON SCREEN MENU
1- TODAY'S PROGRAM
2- PROGRAM
→3- CLOCK SET
4- VCR SET UP
5- TUNER SET UP
Select 1-5
Press MENU to end
VCR SET UP
1- REPEAT
2- DIMMER
3- ON SCREEN
4- BLUE BACK
→5- 2ND AUDIO
6- LEVEL INDICATOR
Select 1-6
Press MENU to end
TUNER SET UP
→1- BAND
2- AFC
3- AUTO CHANNEL SET
4- MANUAL CHANNEL SET
Select 1-4
Press MENU to end
TODAY'S PROGRAM 1
DATE TODAY
→START --:--AM
STOP --:--AM
CHANNEL -- SP
Press SET/SELECT
Press MENU to end
PROGRAM 1
→DATE --
START --:--AM
STOP --:--AM
CHANNEL -- SP
Press SET/SELECT
Press MENU to end
CLOCK SET
→DATE 01-01-00
DAY SUN
TIME 12:00 AM
Press SET/SELECT
Press MENU to end
TODAY'S PROGRAM
→1- PROG 1 5- PROG 5
2- PROG 2 6- PROG 6
3- PROG 3 7- PROG 7
4- PROG 4 8- PROG 8
9-PROGRAM REVIEW
Select 1-9
Press MENU to end
PROGRAM
→1- PROG 1 5- PROG 5
2- PROG 2 6- PROG 6
3- PROG 3 7- PROG 7
4- PROG 4 8- PROG 8
9-PROGRAM REVIEW
Select 1-9
Press MENU to end
2ND AUDIO
→ON
OFF
Press SET for choice
Press MENU to end
BAND
→TV
CATV
Press SET for choice
Press MENU to end
CH 15
TUE 10:30AM
DATE 12-25-90

CLOCK SETTING

ON-SCREEN CLOCK SETTING


JVC ON SCREEN MENU
1- TODAY'S PROGRAM
2- PROGRAM
→3- CLOCK SET
4- VCR SET UP
5- TUNER SET UP
Select 1-5
Press MENU to end
CLOCK SET
→DATE 01-01-00
DAY SUN
TIME 12:00 AM
Press SET/SELECT
Press MENU to end
Month-Day-Year
CLOCK SET
DATE 12-25-90
DAY TUE
→TIME 12:00 AM
Press SET/SELECT
Press MENU to end
CLOCK SET
DATE 12-25-90
DAY TUE
→TIME 10:30 AM
Press SET/SELECT
Press MENU to end
CH 15
TUE 10:30AM
DATE 12-25-90

Guide to messages:

Select 1 — 5: Press numeric key corresponding to the item you wish to select. ("3" for clock setting.)

Press SET/SELECT: Press either SET button to change data at the blinking position, then press SELECT to verify entry and advance to the next position.

Press MENU to end: Press the MENU button to quit the setting mode and start timekeeping.

Operation tips:

- "DATE" sequence is Month, Day, and Year.
- The SET button can be kept pressed for rapid continuous data changing.
- When the complete data for "DATE" has been entered and the SELECT button has been pressed, the day of the week is automatically displayed, and the cursor arrow moves to "TIME".
- Once the clock has been set, the background color remains green and the cursor arrow is positioned at "TIME" when the CLOCK SET menu is opened for readjusting.
- When the MENU button is pressed to end clock setting, the screen automatically returns to the TV picture, with the day of the week, time, and date superimposed over the picture for about 5 seconds.

Power Failure Indicator

The clock display may reset to "SU 12:00 AM" and start to blink. This is not a malfunctioning of the clock, but it indicates that there has been a power failure in excess of 10 seconds. Readjusting the time restores the normal condition of the clock display.

- If the period of power outage is within about 10 seconds, correct time-keeping continues when power is reapplied.

ON-SCREEN TUNER SETTING

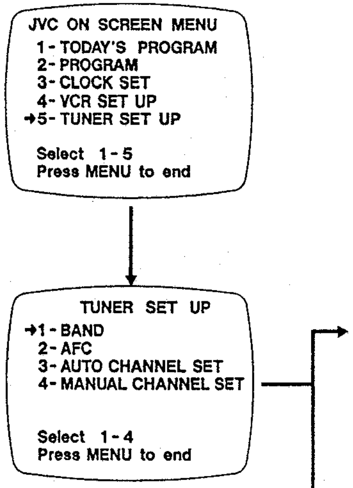
This recorder incorporates an advanced 181-channel cable-compatible frequency synthesized tuner which can be preset on the on-screen menu. First set "BAND" and "AFC" correctly, then proceed to channel presetting either with "AUTO CHANNEL SET" or "MANUAL CHANNEL SET".

BAND
- Set to "TV" if your antenna system is regular broadcast VHF/UHF, VHF only, or UHF only.
- Set to "CATV" if your antenna system is a cable TV line with or without a CATV channel converter/decoder unit.

AFC
- Normally set to "NORM".
- Reset to "SPCL" if no picture appears.

AUTO CHANNEL SET
- Select this item when you wish all available channels to be stored automatically. **We recommend that you use this mode for initial tuner setting.**

MANUAL CHANNEL SET
- Select this item when you wish to store only your favorite channels, to restore skipped channels, or skip previously stored channels.

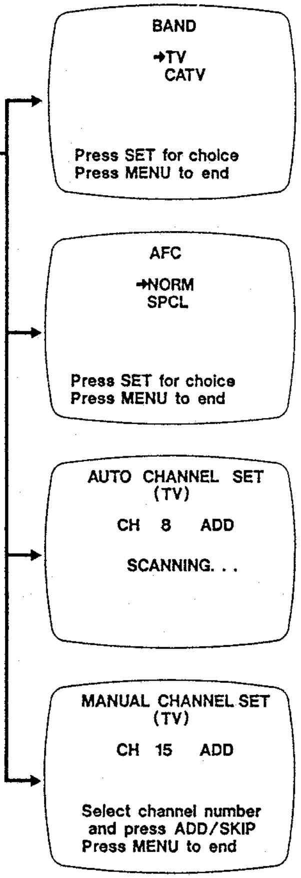

JVC ON SCREEN MENU
1 - TODAY'S PROGRAM
2 - PROGRAM
3 - CLOCK SET
4 - VCR SET UP
→5 - TUNER SET UP
Select 1 - 5
Press MENU to end
TUNER SET UP
→1 - BAND
2 - AFC
3 - AUTO CHANNEL SET
4 - MANUAL CHANNEL SET
Select 1 - 4
Press MENU to end

Guide to messages:

Press SET for choice: Press either SET button to select the required mode. Changing the mode changes the back-ground color.

Press MENU to end: Press the MENU button to verify entry and quit the current setting mode. The screen will change to the TUNER SET UP menu. To immediately return to the normal TV picture from any of the setting modes, press MENU twice.

Select channel number and press ADD/SKIP: By direct 10-key input or channel up/down scanning, specify the channel you wish to store or skip, and then press the ADD button to store it, or SKIP button to skip it. Now the skipped channels will not appear during up/down channel scan tuning.


BAND
→TV
CATV
Press SET for choice
Press MENU to end
AFC
→NORM
SPCL
Press SET for choice
Press MENU to end
AUTO CHANNEL SET
(TV)
CH 8 ADD
SCANNING. . .
MANUAL CHANNEL SET
(TV)
CH 15 ADD
Select channel number
and press ADD/SKIP
Press MENU to end

Operation tips:

- When the AUTO CHANNEL SET menu is opened, scanning will start automatically from the lowest channel in the specified band (TV or CATV). During scanning, the message "SCANNING..." will be displayed. Available channels will be stored with "ADD" displayed briefly (superimposed over the TV picture), and unavailable channels will be skipped with "SKIP" displayed.
- After completion of scanning, the number of the lowest stored channel is displayed.
- For information on correspondence between channel numbers and CATV stations refer to the inserted "CATV Channel Reference Chart".

ON-SCREEN VCR SETTING

Six items can be set with the on-screen VCR SET UP menu.

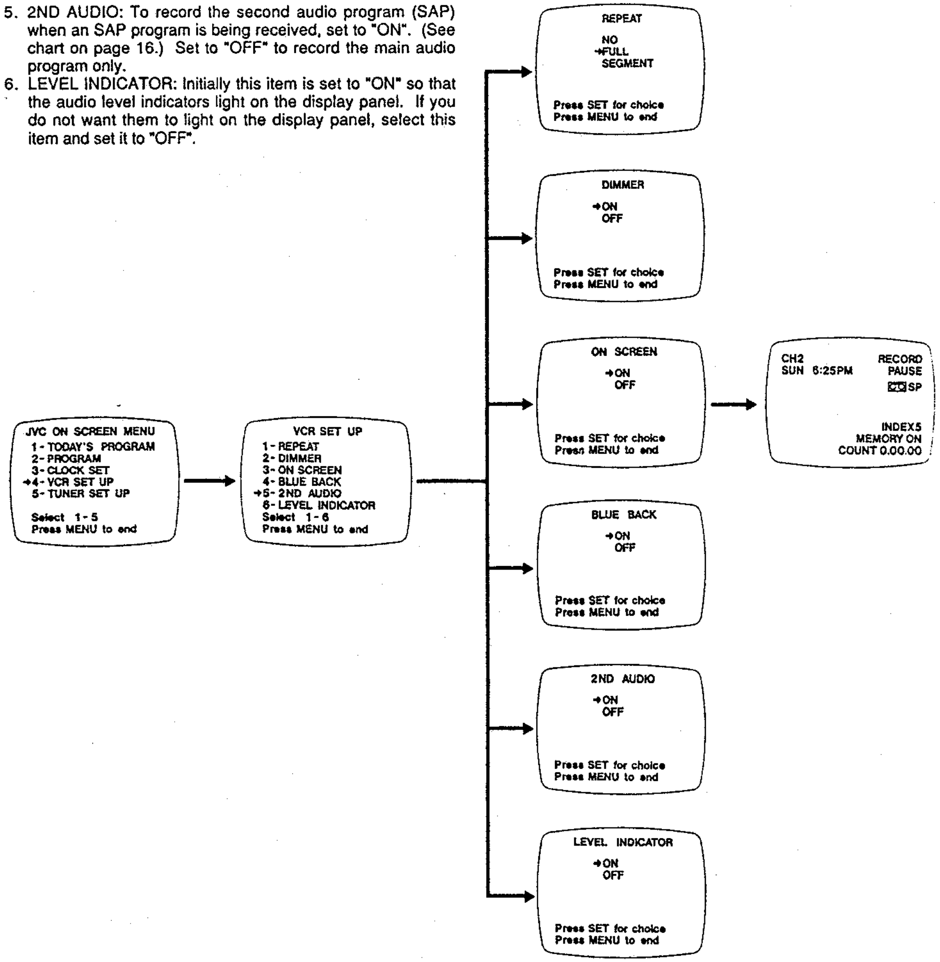
1. REPEAT: To select the desired repeat playback mode. Initially this item is set to "NO" (no repeat). For repeat playback, see "CONVENIENT FACILITIES RELATED TO PLAYBACK" on page 23.
2. DIMMER: To subdue the brightness of the display panel. Initially this item is set to "OFF". If the display panel is too bright, select this item and set it to "ON".
3. ON SCREEN: To take advantage of the on-screen mode display as described on page 12. Initially this item is set to "ON". If you do not want the on-screen display, select this item and set it to "OFF".
4. BLUE BACK: To obtain a blue screen with no audio noise when no signal is available — from tuner, tape, or external source. Initially this item is set to "ON". If you need to view programs from distant stations, select this item and set it to "OFF".
5. 2ND AUDIO: To record the second audio program (SAP) when an SAP program is being received, set to "ON". (See chart on page 16.) Set to "OFF" to record the main audio program only.
6. LEVEL INDICATOR: Initially this item is set to "ON" so that the audio level indicators light on the display panel. If you do not want them to light on the display panel, select this item and set it to "OFF".

Guide to messages:

Select 1 — 6: Press numeric key corresponding to the item you wish to select.

Press SET for choice: Press either SET button to select the required mode. Changing the mode changes the background color.

Press MENU to end: Press to verify entry and quit the current setting mode. The screen will change to the VCR SET UP menu. To immediately return to the normal TV picture from any of the setting modes, press MENU two times.


JVC ON SCREEN MENU
1 - TODAY'S PROGRAM
2 - PROGRAM
3 - CLOCK SET
→4 - VCR SET UP
5 - TUNER SET UP
Select 1 - 5
Press MENU to end
VCR SET UP
1 - REPEAT
2 - DIMMER
3 - ON SCREEN
4 - BLUE BACK
→5 - 2ND AUDIO
6 - LEVEL INDICATOR
Select 1 - 6
Press MENU to end
REPEAT
NO
→FULL
SEGMENT
Press SET for choice
Press MENU to end
DIMMER
→ON
OFF
Press SET for choice
Press MENU to end
ON SCREEN
→ON
OFF
Press SET for choice
Press MENU to end
CH2
SUN 6:25PM
RECORD
PAUSE
SP
INDEX5
MEMORY ON
COUNT 0.00.00
BLUE BACK
→ON
OFF
Press SET for choice
Press MENU to end
2ND AUDIO
→ON
OFF
Press SET for choice
Press MENU to end
LEVEL INDICATOR
→ON
OFF
Press SET for choice
Press MENU to end

LOADING AND UNLOADING A CASSETTE

Motorized Loading System

- The cassette can be loaded even when the power has not been turned on. Inserting a cassette into the loading slot turns the power on automatically.
- The cassette can be unloaded even when the power has been turned off. If a cassette is inside, pressing the EJECT button turns the power on automatically and, after ejection of the cassette, shuts it off automatically.

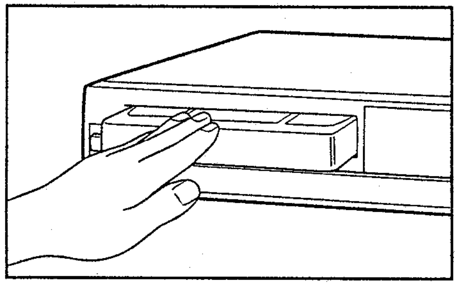
Auto-Play System

- Inserting a cassette, with its safety tab removed, turns the recorder on and playback of the cassette begins automatically.

LOADING

Insert a cassette as illustrated with its labelled side facing you.

- With a cassette inserted, the [OO] mark to indicate "cassette inserted" appears on screen and the display panel.



Notes:

- Be sure to insert the cassette firmly into the slot; otherwise it will be automatically ejected.
- The automatic loading mechanism will operate only when the cassette is inserted correctly.

UNLOADING

Press the EJECT button in the Stop mode. The cassette will be ejected with the [OO] mark blinking.

Caution

- If unloading of a cassette is not possible, check to see whether the TIMER indicator is lit. If so, press the TIMER button so the TIMER indicator extinguishes.
- Do not attempt to pull out the cassette once automatic loading has started.

WARNING

- Do not insert fingers or any foreign object beyond the door flap of the cassette loading slot, as this could lead to injury or damage to the mechanism. Show special caution with children.

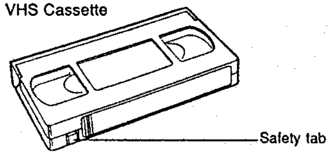
USABLE CASSETTES AND THEIR RECORDING TIME

Both regular VHS and Super VHS cassettes can be used with this video recorder for recording. However, only regular VHS recordings can be made and played back on this video recorder. Super VHS recordings can neither be made nor played back on this video recorder.

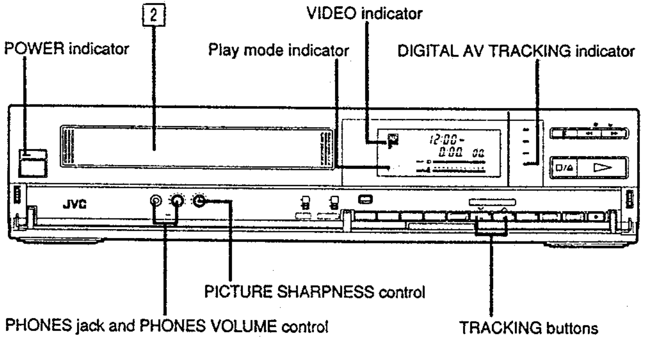
Type of Cassette	Recording/Playback Time	
	SP (Standard Play)	EP (Extended Play)
T-30	30 minutes	1 hour, 30 minutes
T-60	1 hour	3 hours
T-90	1 hour, 30 minutes	4 hours, 30 minutes
T-120	2 hours	6 hours
T-160	2 hours, 40 minutes	8 hours

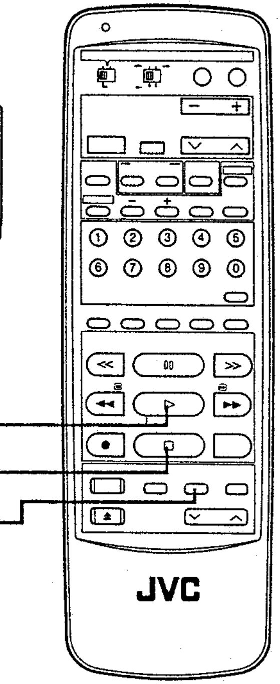
ACCIDENTAL ERASURE PREVENTION

- Video cassettes are equipped with a safety tab to prevent accidental erasure. When the tab is removed, recording cannot be per-formed. If you wish to record on a cassette whose tab has already been removed, use adhesive tape to block the hole.



PLAYING BACK A VIDEO CASSETTE


2
VIDEO indicator
POWER indicator
Play mode indicator
DIGITAL AV TRACKING indicator
JVC
PICTURE SHARPNESS control
PHONES jack and PHONES VOLUME control
TRACKING buttons



PREPARATION

1. Switch on the TV receiver.
   - Set the TV receiver to your video channel (3 or 4), or to the AV mode depending on the connection.
2. Load a pre-recorded cassette.
   - Power will be switched on automatically.
   - When a cassette with its safety tab removed is loaded, playback starts automatically with the Play mode indicator appearing on the display panel and "PLAY" on the screen for 5 seconds.

OPERATING PROCEDURE

1. Press the PLAY button.
2. Make AUDIO MONITOR setting as required. See page 16.
3. Press the STOP button at the end of the program.

DIGITAL AV TRACKING SYSTEM

This recorder incorporates a digital tracking system for automatic tracking adjustment. In most cases you do not have to adjust the tracking.

- When you start playback after inserting a tape, the digital tracking system automatically adjusts the tape path relative to the heads to obtain the best possible pictures and hi-fi stereo sound.
- If there is no recorded Hi-Fi audio, tracking is set referring only to the video signal. The audio output is automatically switched to normal audio.
- This automatic tracking adjustment also takes place when the playback output level drops below a certain level.
- The DIGITAL AV TRACKING indicator ❺ blinks while the system is searching for optimum tracking, and remains lit as long as the automatic tracking mode continues.

If automatic tracking fails, and some noise bars are visible on the screen, use the manual tracking mode.

- Press both TRACKING buttons simultaneously to cancel the automatic mode, then press either button to move noise bars out of the screen.
- To return to the automatic mode, press both buttons simultaneously.

Notes:

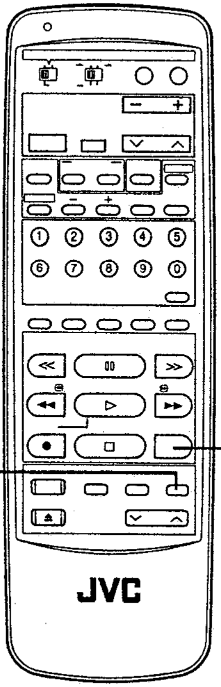
- The SP/EP button may be in either position. The SP, LP or EP mode recording is automatically detected and played back at the correct speed.
- For various convenience facilities and special-effects features available during playback, see the next two pages.
- When the PLAY button is pressed to start playback, the VIDEO mode is automatically entered and the VIDEO indicator lights.
- The tape-end auto-rewind mechanism functions in the Play, Fast Forward and Forward Search modes.
- Images on the screen can be adjusted to a preferred softer or sharper definition by turning the PICTURE SHARPNESS control.
- When listening through headphones, if the volume is too low or too high, adjust the PHONES VOLUME control for comfortable listening.

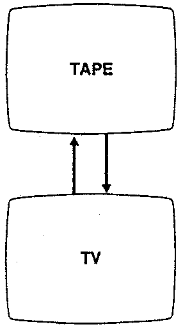
CONVENIENT FACILITIES RELATED TO PLAYBACK

TV MONITOR

When viewing a video tape, you can check the TV program being received by the VCR's built-in tuner without stopping the tape.

- Press the TV MONITOR button to check TV programs during tape playback. The tuned-in TV program will be visible on the TV screen until the TV MONITOR button is pressed again.
- If you press the TV MONITOR button after engaging a visual search mode, such as Skip Search, the TV screen will switch to TV, and normal tape playback will automatically resume after the specified point is reached. Index Search and Realtime Go-To in the visual search mode (refer to pages 32 and 33) can be carried out while you are watching the TV program.





SKIP SEARCH

During playback, press the SKIP SEARCH button from 1 to 4 times to zip through 30-sec. to 2-min. sections of tape. Playback resumes automatically. Press the PLAY button to cancel the Skip Search mode midway.

MEMORY PLAY

If you want to watch the tape from its beginning after rewinding, you do not have to wait for completion of rewind to press the PLAY button.

- Press the REW button and then PLAY button within 2 seconds. Playback will start automatically at the beginning of the tape. (Check to see that the counter memory indicator [M] is off).

  If you want to watch the tape from the counter reading of "0H 00M 00s", press the COUNTER MEMORY button to obtain [M]. Then, press the REW (or FF) button and then PLAY.
- While the tape is being rewound, the PLAY indicator is blinking. To cancel the Memory Play mode and go to another mode, press the corresponding button (STOP, PLAY, FF, REW).

More Next-Function Memory Features

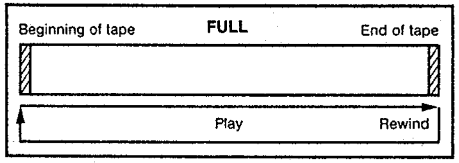
If you are going to eject the cassette, or turn the power off after rewinding the tape, press the EJECT or POWER button within 2 seconds after pressing the REW button.

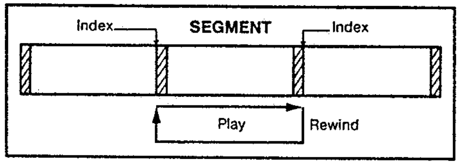
Note:

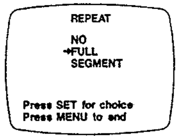
- For various tape access methods that can be used in different applications, refer to pages 32 and 33.

REPEAT PLAYBACK — FULL OR SEGMENT

This function allows you to set the VCR for repeated playback (5 times) of the entire tape ("FULL" repeat) or repeated playback (5 times) of a segment of the tape from one index mark to the next ("SEGMENT" repeat).

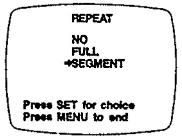





REPEAT

NO
→FULL
SEGMENT

Press SET for choice
Press MENU to end


REPEAT

NO
FULL
→SEGMENT

Press SET for choice
Press MENU to end

1. Open the VCR SET UP menu. (See page 20.)
2. If "SEGMENT" is selected, you can designate the segment using the Index Search mode or Index Mark function. (See page 33.)

Notes:

- During rewind iin the Repeat mode, "REPEAT" is displayed on the screen.
- After repeat playback, be sure to reset "REPEAT" to "NO".

SPECIAL-EFFECTS PLAYBACK

VARIABLE-SPEED SEARCH AND SLOW MOTION

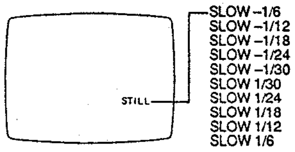
VARIABLE SEARCH buttons

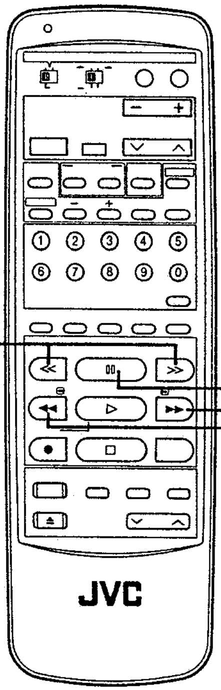
The VARIABLE SEARCH buttons control both the direction and speed of tape search, making possible fast- and slow-motion playback in either forward or reverse direction from either the Still or Play mode.

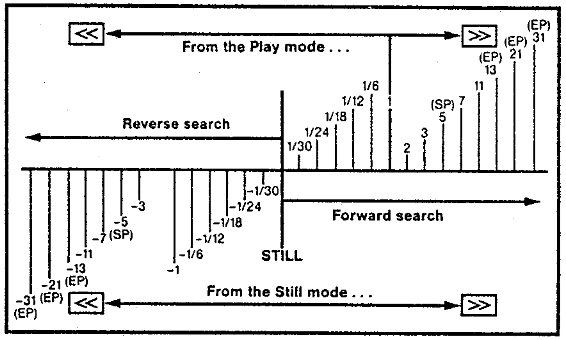
Operation tips:

- To increase speed while in the forward direction, press >> repeatedly; to decrease, press << repeatedly. The direction reverses after leaving the Still mode.
- To increase speed while in the reverse direction, press << repeatedly; to decrease, press >> repeatedly. The direction reverses after leaving the Still mode.
- To return to normal playback, press the PLAY button.

ON-SCREEN DISPLAY







STILL PLAYBACK AND FRAME ADVANCE

PAUSE/STILL button

- To view a still picture, press this button in the Play mode.
- To advance the picture frame by frame, press this button again.
- To return to normal playback, press the PLAY button.
- When the Still mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.

HIGH-SPEED FORWARD SEARCH

FF button

- To fast forward the tape, press this button in the Stop mode.
- To shuttle search the tape in the forward direction, press this button in the Play mode.
- The shuttling speed is about 7 times normal in the SP mode and 21 times normal in the EP mode.
- Press the PLAY button to return to normal playback.
- For briefer scanning, keep the FF button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled. In this case, the shuttling speed in the EP mode is about 13 times normal.

HIGH-SPEED REVERSE SEARCH

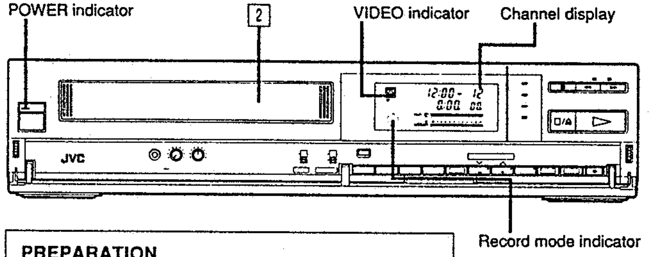
REW button

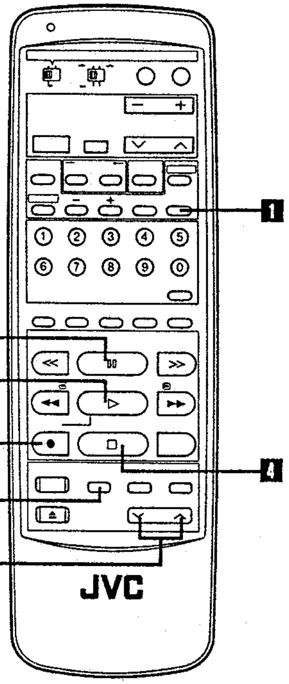
- To rewind the tape, press this button in the Stop mode.
- To shuttle search the tape in the reverse direction, press this button in the Play mode.
- The shuttling speed is about 7 times normal in the SP mode and 21 times normal in the EP mode.
- Press the PLAY button to return to normal playback.
- For briefer scanning, keep the REW button pressed for more than 2 seconds; when you release the button, the Search mode will be cancelled. In this case, the shuttling speed in the EP mode is about 13 times normal.

Notes:

- With some televisions, the still picture may be unstable. If vertical vibration of the picture is observed, attempt to correct it by pressing the V.LOCK buttons.
- If noise bars are visible in the Still, Slow, or Frame-by-Frame mode, attempt to correct it in the manual tracking mode as described on page 22.
- When the Still mode is engaged from reverse search, the still picture may slightly shift after a moment because the mode is switched to forward search.
- No audio is available during any special-effects playback mode.
- Special-effects playback is not possible in the LP mode. When a special-effects mode is engaged during playback of LP recorded tapes, the picture disappears from the screen. If you happen to engage one of the special-effects modes while playing an LP tape, simply press the PLAY button to restore the picture.

RECORDING TV PROGRAMS





PREPARATION

1 Switch on the TV receiver.
  - Set the TV receiver to your video channel (3 or 4), or to the AV mode (depending on the connection).

2 Load a cassette (with safety tab in place). Power will be switched on automatically.

3 Press the TV/VIDEO button so that the VIDEO indicator lights.
  - Skip this step when the TV is set to the AV mode.

OPERATING PROCEDURE

1 Select the recording speed (SP or EP).
SP: 2 hours 40 minutes with a T-160 cassette.
EP: 8 hours with a T-160 cassette.

2 Select the channel you wish to record with the CHANNEL ∨/∧ button.

3 Press the REC and PLAY buttons simultaneously to start recording. "MARK" will appear on the screen and blink to show that an index code is being recorded.
(When using the VCR's front panel control buttons, press REC/ITR once to start recording.)

4 Press the STOP button at the end of the program.

RECORDING ONE PROGRAM WHILE WATCHING ANOTHER

A program not being viewed can be recorded while you enjoy viewing another program.
This permits the recorded program to be played back later at your convenience.

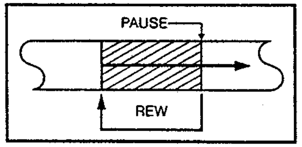
The key points to remember are:
- Select the channel you wish to record with the recorder's channel selector.
- Select the channel you wish to view with the TV receiver's channel selector.
- With RF-only connection, the TV/VIDEO button should be in the TV mode (VIDEO indicator off). If the indicator is lit, press the TV/VIDEO button to turn it off. (See page 14.)

Notes:
- If the REC/ITR button is pressed more than once, the Instant Timer Recording mode will be entered (see page 28). To return to ordinary recording, repeatedly press the REC/ITR button until the ITR indicator on the display panel goes out.
- If there is part of the program you do not want to record, press the PAUSE/STILL button. To release the Pause mode, press the PLAY button.
- When recording is restarted from the Record-Pause mode, assemble recording is performed so that the playback picture will not distort at the edit point. A few frames recorded before the pause may be erased due to overlap of the new recording. This is not due to any defect of the unit.
- When the Record-Pause mode continues for longer than about 5 minutes, the Stop mode will be entered automatically.
- If the record button cannot be engaged, check to see if the cassette safety tab has been removed. (See page 21).
- When the end of the tape is reached during recording, the tape is automatically rewound to the beginning and stops.
- The built-in tuner's automatic channel lock mechanism prevents the selected channel from being altered during recording. Therefore, if you wish to change the channel during recording, first engage the Record-Pause mode and then select a different channel.

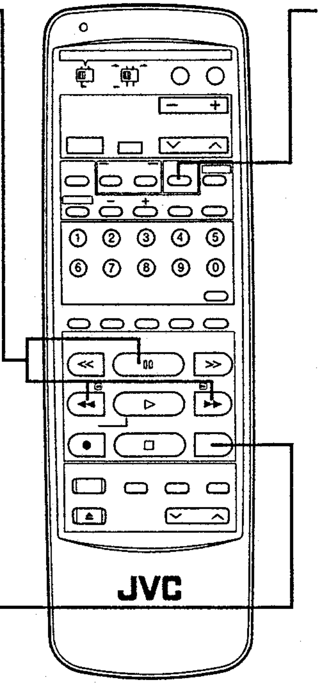
CONVENIENT FACILITIES RELATED TO RECORDING

RETAKE FUNCTION

While in the Record-Pause mode, pressing the FF or REW button initiates normal-speed search in the corresponding direction. Releasing the button engages the Record-Pause mode. If you have recorded unnecessary material because of having engaged the Record-Pause mode too late, use this function to return to the position where you want the next recording to start. Then, simply press the PLAY button when you want to re-start recording.



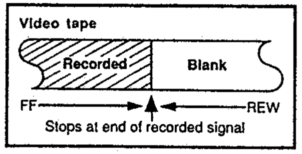
Note:
- Rainbow noise may occur in the rewound and re-recorded section.



BLANK SEARCH

When you want to record a new program on a partially recorded tape, use this function to automatically locate the end of a recorded section. Even when a fully recorded tape is used for re-recording new material, this system can be used to detect the end of the newly-recorded material.

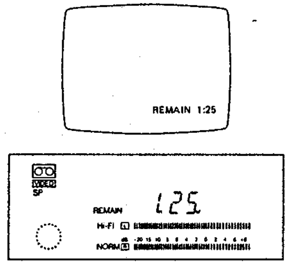
- Insert a cassette and press the SKIP/BLANK SEARCH button.
- If a recorded signal is present, the recorder automatically enters the FF mode, and stops automatically around the end of that recorded section. Before starting recording, play back the tape to determine where to start a new recording.
- If the SKIP/BLANK SEARCH button is pressed where no signal is recorded, the recorder automatically enters the REW mode, searches for the end of the preceding recorded segment, and stops.
- When the SKIP/BLANK SEARCH button is pressed, the tape counter is automatically switched to the REMAIN mode and shows the remaining tape time in hours and minutes when the end of the recorded segment is located. To switch back to the realtime counter mode, press the DISPLAY button.



REMAINING TAPE TIME INDICATION

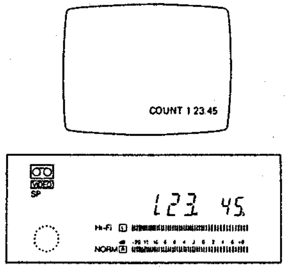
The tape counter can be switched to display the remaining tape time.
- Press the DISPLAY button (or COUNTER/REMAIN/DATE button when using the VCR's front panel control buttons) to obtain the REMAIN tape time indication in hours and minutes on the screen and FDP.

Notes:
- During recording, the remaining tape length is calculated in reference to the recording mode selected by the SP/EP button; during playback, it is calculated in reference to the recorded mode of the tape being played back (SP or EP).
- The indicated remaining time is approximate.



ELAPSED RECORDING TIME INDICATION

When you need to know the exact time of a recording, press the COUNTER RESET button before starting recording or playback. The counter will be reset to "0H 00M 00S" and show the exact elapsed time as the tape runs. Press the DISPLAY button anytime to check the current tape time position on the screen.



OTHER RECORDING POSSIBILITIES

RECORDING STEREO TV PROGRAMS

The HR-D870U is capable of automatically receiving stereo TV programs in stereo. When a stereo program is being received, the STEREO indicator lights and recording is made in stereo on both the Hi-Fi and normal audio tracks. To listen to the stereo soundtrack during recording, press the remote control's AUDIO MONITOR button so that the HIFI indicator lights on the screen and display panel.

RECORDING SAP (SECOND AUDIO PROGRAM) TV PROGRAMS

When an SAP TV program is being received, the SAP indicator lights. To record such a program, pay attention to two additional controls and the basic operation described on page 25.

- Set "2ND AUDIO" in the VCR SETUP menu to "ON" to record the second audio program. To record the main audio program only, set "2ND AUDIO" to "OFF". (See page 20.)
- To listen to the SAP soundtrack being recorded, press the AUDIO MONITOR select button so that the NORM indicator lights on the screen and display panel.

Note:

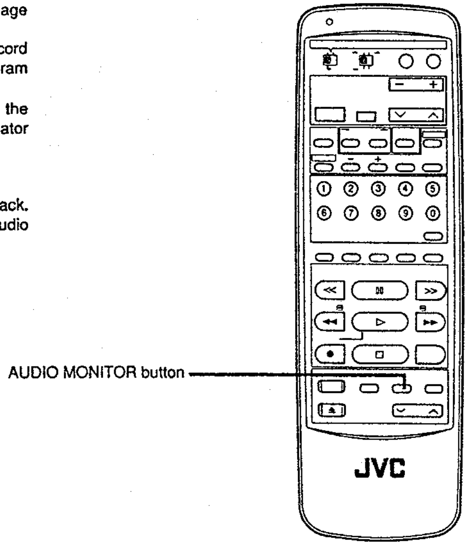
SAP programs can be recorded only on the normal audio track. It is not possible to record any SAP program on the Hi-Fi audio track, regardless of any setting.

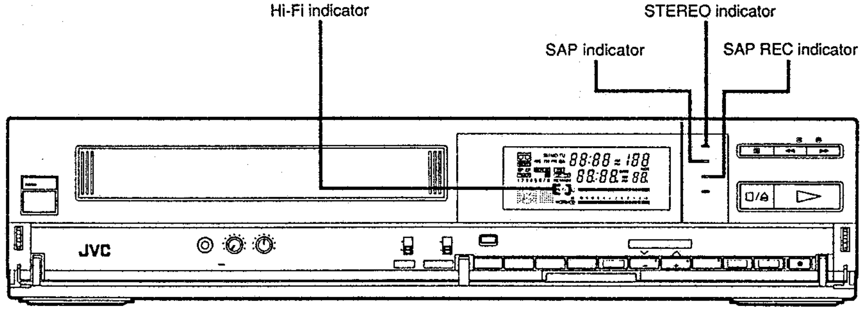
USING THE HR-D870U AS AN AUDIO DECK

Audio-only recording

You can record audio only (without recording any video signal) on the normal and Hi-Fi audio tracks. This means you can record a continuous 8-hour FM program onto a single cassette (T-160)

- Connect an audio source (such as an FM tuner) to a pair of AUDIO IN connectors.
- DO NOT connect any equipment to the VIDEO IN connector.
- Obtain "AU" (AUX) in the channel position on the display panel with either the numeric key "0" or the CHANNEL buttons until "0" appears, then wait for it to change to "AU".





INSTANT TIMER RECORDING

24-HOUR TIMER

The 24-Hour Timer Recording feature allows unattended automatic starting and stopping of the recording of a single program which starts within a 24-hour period.

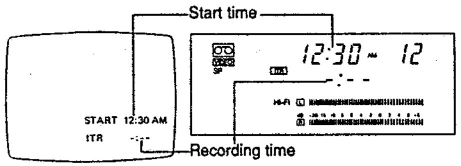
Preparation

1. Turn on the TV and tune to the video channel (if you wish to set the timer using the TV screen display).
2. Insert a cassette with its safety tab in place. The recorder turns on automatically.
3. Press the TV/VIDEO button to enter the Video mode with the "VIDEO" indicator lighting on the FDP.
4. Select the channel you wish to record from.
5. Select the recording speed, "SP" or "EP", by pressing the SP/EP button.

Setting the timer

1. Press the START button to engage the 24-Hour Instant Timer Set mode. The following appears on the screen with the current time in the START time position.

ON-SCREEN DISPLAY **DISPLAY PANEL**



   - Each pressing delays the START time by 30 minutes
   - For a more precise time setting, use the SELECT and SET buttons.
2. After reaching the desired START time, press the REC/ITR button the required number of times to set the desired length of recording time.
   - For a more precise time setting, use the SELECT and SET buttons.
3. After confirming the START time and recording length, press the POWER button.
   - "ITR" lights on the display panel and the 24-Hour Instant Timer Standby mode will automatically engaged.
   - If the program has not been correctly preset, the "ITR" indicator will blink for about 10 seconds when the POWER button is pressed. Recheck the programmed data.

Notes:

- At each step of the timer setting procedure, if no data is entered within 60 seconds, the 24-Hour Timer Set mode is cancelled, and the current time is displayed.
- To cancel the 24-Hour Timer Set mode, press the CANCEL button once or twice depending on the setting status.
- 24-Hour Timer Recording has priority over other timer program settings; therefore, no other programs, set for timer recording, will be recorded until 24-Hour Timer Recording has been executed.
- Even with the power off, pressing the START button displays the 24-Hour Timer settings for about 10 seconds for quick checks.

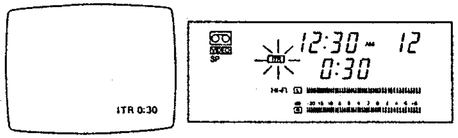
OFF-TIMER

- Start recording as described on page 25.

After you start recording, the recorder can be set to stop automatically after a certain period of time. Use this facility for starting a recording before you go to bed or leave home.

1. Press the REC/ITR button while recording (or twice if in the Stop mode.
   - The following indication will appear on the display, to show that the recorder is recording in the Instant Timer Recording mode and power will switch off after 30 minutes.

ON-SCREEN DISPLAY **DISPLAY PANEL**



2. Each time the ITR button is pressed, recording time increases by 30 minutes to a maximum of 4 hours. If the REC/ITR button is pressed again, the Normal Recording mode will be entered.
   - For a more precise time setting, use the SELECT and SET buttons to set to the exact time required (possible up to 8 hours and 59 minutes).

Notes:

- While recording is in progress, the displayed time counts down; when 0:00 is reached, the Record mode is released after 10 seconds and the power is switched off.
- If you want to stop recording after having started recording in the Instant Timer Record mode, press the STOP button.
- If instant timer recording is engaged while the unit is in the Pause mode, the timer will count down normally, but recording will not begin until the PLAY button is pressed.
- When the Instant Timer Record-Pause mode continues for longer than 5 minutes, the mode is released and power is switched off.
- If you want to check the elapsed time (Realtime Counter reading) on the screen while performing Instant Timer Recording, press the COUNTER/REMAIN/DATE button or DISPLAY button on the remote control to obtain the desired indication (the ITR indication disappears). After about 5 seconds, the indicator will return to the ITR mode and the remaining time indication will reappear automatically.

TIMER RECORDING

ON-SCREEN TIMER PROGRAMMING

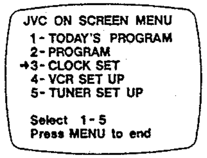
The built-in 1-month/8-event programmable timer permits recording of preset channels on preset days at preset times while you are away.

- To program the timer, use the on-screen menu system.
- The on-screen menu system has two programming modes: TODAY'S PROGRAM, and PROGRAM.
- For recording of a TV program which starts within 24 hours, use the TODAY'S PROGRAM mode. Then you do not have to set the date.
- For recording of any other program including daily and weekly serials, use the PROGRAM mode.
- The PROGRAM REVIEW mode is also available, and this mode is accessible from either the TODAY'S PROGRAM or PROGRAM mode.

Preparation

- First load a cassette with safety tab in place; power will be switched on automatically.
- Turn on the television and set it as required.

Press the MENU button.



```
JVC ON SCREEN MENU
 1- TODAY'S PROGRAM
 2- PROGRAM
→3- CLOCK SET
 4- VCR SET UP
 5- TUNER SET UP

 Select 1 - 5
 Press MENU to end
```

Guide to messages:

Select 1 — 5: Press numeric key corresponding to the item you wish to select. ("1" for TODAY'S PROGRAM, "2" for PROGRAM.) (The SET/SELECT buttons can also be used; move the cursor arrow with SET and verify with SELECT.)

Press SET/SELECT: Press either SET button to enter data at the blinking position, then press SELECT to verify entry and advance to the next position.

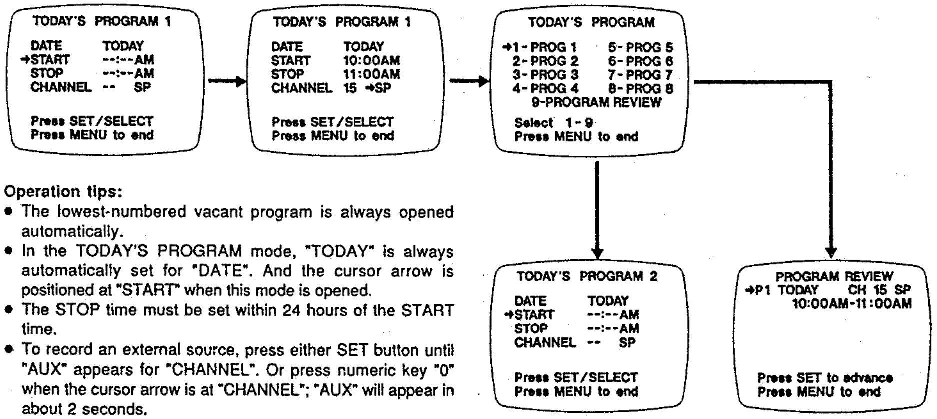
Press MENU to end: Press to quit the current mode. When pressed from an individual program setting page (program number is displayed on top), or from the PROGRAM REVIEW mode, the program list page is opened. When pressed from the program list page, the screen returns to the normal TV picture.

Return to PROGRAM. Press MENU: If a program number which has been already set in the PROGRAM mode is called up in the TODAY'S PROGRAM mode, this message appears, indicating that changing the data is not possible in the TODAY's PROGRAM mode. Engage the PROGRAM mode after returning to the main menu by pressing MENU.

Return to TODAY'S PROGRAM. Press MENU: If a program number which has been already set in the TODAY'S PROGRAM mode is called up in the PROGRAM mode, this message appears, indicating that changing the data is not possible in the PROGRAM mode. Engage the TODAY'S PROGRAM mode after returning to the main menu by pressing MENU.

Press SET to advance: Press SET button to advance program numbers in the PROGRAM REVIEW mode.

USING "TODAY'S PROGRAM" MODE



```
TODAY'S PROGRAM 1

 DATE      TODAY
→START     --:--AM
 STOP      --:--AM
 CHANNEL   --   SP

 Press SET/SELECT
 Press MENU to end
```

```
TODAY'S PROGRAM 1

 DATE      TODAY
 START     10:00AM
 STOP      11:00AM
 CHANNEL   15 →SP

 Press SET/SELECT
 Press MENU to end
```

```
TODAY'S PROGRAM

→1- PROG 1    5- PROG 5
 2- PROG 2    6- PROG 6
 3- PROG 3    7- PROG 7
 4- PROG 4    8- PROG 8
   9-PROGRAM REVIEW

 Select 1 - 9
 Press MENU to end
```

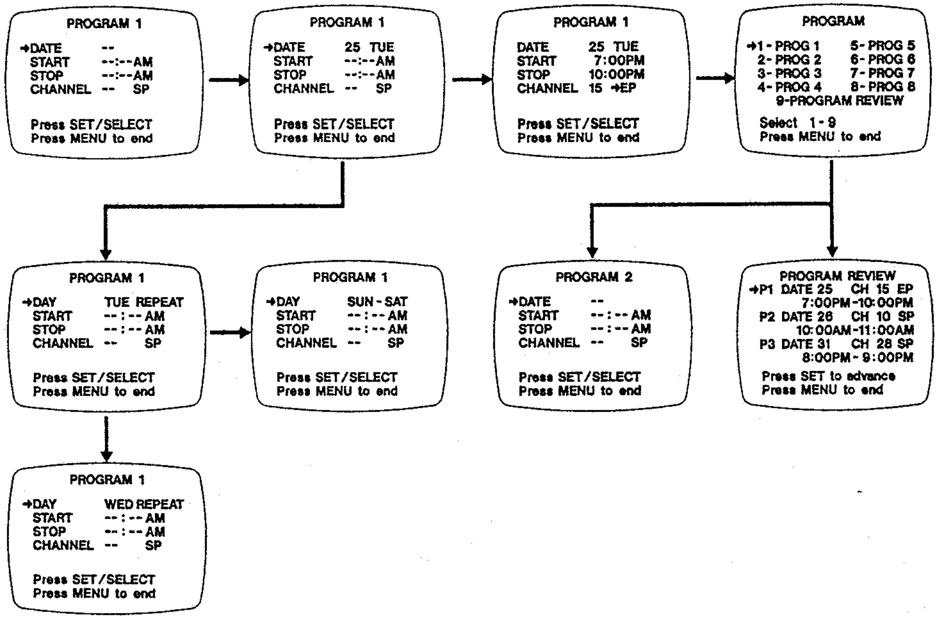
```
TODAY'S PROGRAM 2

 DATE      TODAY
→START     --:--AM
 STOP      --:--AM
 CHANNEL   --   SP

 Press SET/SELECT
 Press MENU to end
```

```
PROGRAM REVIEW
→P1 TODAY     CH 15 SP
       10:00AM-11:00AM



 Press SET to advance
 Press MENU to end
```

Operation tips:

- The lowest-numbered vacant program is always opened automatically.
- In the TODAY'S PROGRAM mode, "TODAY" is always automatically set for "DATE". And the cursor arrow is positioned at "START" when this mode is opened.
- The STOP time must be set within 24 hours of the START time.
- To record an external source, press either SET button until "AUX" appears for "CHANNEL". Or press numeric key "0" when the cursor arrow is at "CHANNEL"; "AUX" will appear in about 2 seconds.
- When a full set of data has been entered, the screen color changes from blue to green.
- Do not forget to check the recording mode "SP" or "EP", and reset it if necessary.

USING "PROGRAM" MODE



```
PROGRAM 1

→DATE      --
 START     --:--AM
 STOP      --:--AM
 CHANNEL   --    SP

 Press SET/SELECT
 Press MENU to end
```

```
PROGRAM 1

→DATE      25  TUE
 START     --:--AM
 STOP      --:--AM
 CHANNEL   --    SP

 Press SET/SELECT
 Press MENU to end
```

```
PROGRAM 1

 DATE      25  TUE
 START      7:00PM
 STOP      10:00PM
 CHANNEL   15  →EP

 Press SET/SELECT
 Press MENU to end
```

```
PROGRAM

→1- PROG 1    5- PROG 5
 2- PROG 2    6- PROG 6
 3- PROG 3    7- PROG 7
 4- PROG 4    8- PROG 8
   9-PROGRAM REVIEW

 Select 1 - 9
 Press MENU to end
```

```
PROGRAM 1

→DAY       TUE REPEAT
 START     -- : -- AM
 STOP      -- : -- AM
 CHANNEL   --     SP

 Press SET/SELECT
 Press MENU to end
```

```
PROGRAM 1

→DAY       SUN - SAT
 START     -- : -- AM
 STOP      -- : -- AM
 CHANNEL   --     SP

 Press SET/SELECT
 Press MENU to end
```

```
PROGRAM 2

→DATE      --
 START     -- : -- AM
 STOP      -- : -- AM
 CHANNEL   --     SP

 Press SET/SELECT
 Press MENU to end
```

```
PROGRAM REVIEW
→P1 DATE 25    CH 15 EP
       7:00PM-10:00PM
 P2 DATE 26    CH 10 SP
      10:00AM-11:00AM
 P3 DATE 31    CH 28 SP
       8:00PM- 9:00PM
 Press SET to advance
 Press MENU to end
```

```
PROGRAM 1

→DAY       WED REPEAT
 START     -- : -- AM
 STOP      -- : -- AM
 CHANNEL   --     SP

 Press SET/SELECT
 Press MENU to end
```

Operation tips:

- The lowest-numbered vacant program is always opened automatically.
- When a date (the day of the month) is entered, the day of the week is automatically set.
- The STOP time must be set within 24 hours of the START time.
- To record a weekly serial, after specifying the date, press the REPEAT button. "DATE" will change to "DAY" and the day of the week and "REPEAT" will appear. You can change the day of the week by pressing SET + button.
- To record a daily serial, after specifying the date, press the REPEAT button twice. "SUN-SAT" will appear for "DAY". By further pressing the REPEAT button, you will get "MON-SAT" and "MON-FRI".
- To check preset programs, press the MENU button from any individual program setting page. A program list page titled PROGRAM will appear. If you want to check a specific program, press the numeric key corresponding to that program number. (If the opened program has been preset in the TODAY'S PROGRAM mode, the message "Return to TODAY'S PROGRAM. Press MENU" will appear.) If you want to check all programs, select "9". The PROGRAM REVIEW mode will be engaged, allowing you to check all programs which have been set both in the TODAY'S PROGRAM and PROGRAM modes.

IMPORTANT

- Be sure to press the TIMER button to engage the Timer Standby mode after having programmed the timer.
- Be sure to check the FDP after pressing the TIMER button.
  - — Is the TIMER indicator lit?
  - — Are the numbers of the preset programs lit?
- For error indications, see page 31.

IMPORTANT INFORMATION ON TIMER RECORDING

CHECKING AND CANCELLING/RE-PROGRAMMING PROGRAMS

Since executed programs are automatically cleared (except those for daily and weekly serials), there may be rare cases that the entire program memory is full. If this should happen, when you open either the TODAY'S PROGRAM or PROGRAM mode, program number "1" is displayed, instead of the lowest-numbered vacant program. In such cases, check the preset programs and cancel some or re-program the data.

1. Press the MENU button again to obtain the program list page.
2. Press numeric key "9" to call the PROGRAM REVIEW mode.
3. Check all preset programs and determine the number of the program to be cancelled.
4. Press the MENU button to return to the program list page.
5. Select the program to be cancelled or re-programmed.
6. To cancel, press the CANCEL button. To re-program the data, enter new data with the SET/SELECT buttons.

Note:

- If you call up a programming display on the screen while timer recording is in progress, the indications may not be correct. If this should happen, press the MENU button to return to the main menu screen, and then call up a programming display.

VARIETY OF DAY SETTING POSSIBILITIES

No.	Setting	Indication
1	One day within one month	Date + Day
2	Weekly serial recording	Day + REPEAT
3	Daily serial recording from Sunday through Saturday	SUN — SAT
4	Daily serial recording from Monday through Saturday	MON — SAT
5	Daily serial recording from Monday through Friday	MON — FRI

ERROR INDICATIONS

- When the TIMER button is pressed with a cassette loaded and the timer correctly programmed, the TIMER indicator on the display will light with the corresponding preset program number(s) also lighting and the power is turned off.
- When you have preset several programs at a time, confirm that all the preset program numbers light together with the TIMER indicator when the TIMER button is pressed. The program whose number does not light has not been correctly preset. Recheck the programmed data.
- If all programs have been wrongly preset, the TIMER indicator will blink for about 10 seconds when the TIMER button is pressed, and then the Timer Standby mode will be cancelled.
- If the TIMER button is pressed when a cassette is not loaded, the TIMER and 🖭 indicators will continue blinking. Also a programmed timer recording will not be executed, even if you insert a cassette after the start time has passed.
- If a cassette with its safety tab removed has been loaded, it will be ejected automatically when the TIMER button is pressed. The TIMER and 🖭 indicators will continue blinking.
- As long as the TIMER button is engaged with the TIMER indicator lit, unloading of the cassette is not possible.

TIMER OPERATION

- Tape loading starts 20 seconds before the preset start time and the recording start signal is triggered 2 seconds before the preset time so that recording starts exactly at the preset time.
- During timer recording, the number of the program that is presently operating will be blinking.
- After timer recording, the power is switched off and the auto-rewind mechanism does not function. If the end of the tape is reached during timer recording, the cassette is automatically ejected and then the power is switched off with the TIMER indicator blinking.
- If a power failure should occur, not only time-keeping stops, but also all the preset data will be cancelled. (A blinking SU 12:00 AM indicates this after power has been reapplied.) In such cases, first correct the time indication and then re-enter the programming data.

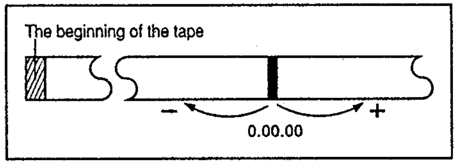
CONVENIENT TAPE ACCESS FUNCTIONS

REALTIME TAPE COUNTER

Unlike usual tape counters which show tape locations in numbers, this realtime tape counter shows tape time precisely in hours, minutes and seconds in all modes. The counter resets automatically when a cassette is inserted.

REALTIME SEARCH

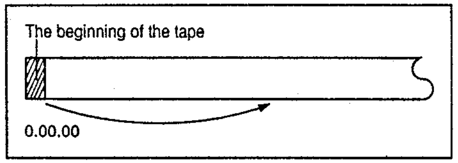
To locate any point on the tape a specified time away from the current position in either direction.



1. Press the remote control's GO-TO button while in the Play, Still or Stop mode.
   - The screen will show "GO-TO –.–.–" if the recorder did not detect the leader tape when the cassette was loaded; it will show the current tape counter reading if the leader tape has been detected. The corresponding indication will appear on the display panel.
   - "GO-TO 0.02.34" (for example) will appear if the recorder has already detected the leader tape, to show the current tape counter reading in terms of realtime from the tape's beginning.
2. Press the SET "–" button (for reverse direction: "–" appears in front of the first "0") or press the SET "+" button (for forward direction: no indication).
3. Specify the time to the point to be located, by using the numeric keys.
   - Always key in a full number.
4. Press the PLAY or STOP button (PAUSE/STILL button, if either the Play or Still mode is already engaged).
   - Depending on the situation, search will take place in either the Shuttle Search mode or in the Fast Forward or Rewind mode. After the specified point is reached, playback starts automatically, the tape stops automatically or enters the Still mode, depending on the command.

REALTIME GO-TO

To locate any point on the tape a specified time away from the beginning of the tape.



The procedure is the same as for the Realtime Search except step 2. Specifying the direction is not necessary.

Notes:

- Each step in the operation procedure must be followed by the next within 60 seconds, otherwise the Go-To or Search mode will be cancelled.
- Use of the other control buttons while in the Go-To or Search mode cancels that mode.
- If the specified time exceeds the tape length, the tape fast forwards to the end and then rewinds to the beginning and stops or enters the Play mode.

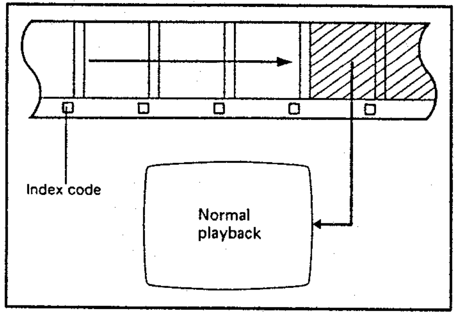
COUNTER MEMORY FUNCTION

1. Press the C. RESET button at a point which you may wish to locate later.
   - The counter will read "0H 00M 00S".
2. Press the C. MEMORY button. 🄼 will appear in the FDP and "MEMORY ON" will appear on the screen.
3. Press the REW (or FF) button when you need to return to the designated point.
   - The tape will rewind (or fast forward) and stop at about "0H 00M 00S" automatically.
   - The Counter Memory function can also be used in conjunction with the Memory Play function (page 23).

Continued on next page . . .

INDEX SEARCH

The Index Search function gives you automatic access to the beginning of individual recordings on the cassette tape. An index code is automatically placed on the tape's control track each time a recording is begun. You can access any one of up to 99 of these indexed segments in either the forward or reverse direction.



1. Press the INDEX button while in the Play or Stop mode.
   - The channel display of the display panel will change to the Index Search mode and "INDX" will light. "INDEX" will appear on the screen.
2. Specify the index number (1-99) using the numeric keys within 10 seconds.
   - The specified number will appear in the display panel and on the screen.
3. Press either the FF or REW button.
   - The tape will move and the index numbers count down to 0, where normal playback will start.
   - If the INDEX button was pressed in the Play mode, the screen shows search pictures; if the button was pressed in the Stop mode, the index codes are detected in the Rewind or Fast-Forward mode.

Notes:
- To cancel the Index Search mode before completion, press the PLAY or STOP button.
- If the end of the tape is reached while still in the Index Search mode, the mode is cancelled and the tape rewound.

MANUAL INDEX MARK/ERASE

Index codes are automatically placed at the beginning of recordings which are started from the Stop or Timer Standby mode. You can use the MARK button to add extra codes, and the ERASE button to erase codes. In neither case is there any effect on the audio or video recordings on the tape.

Erase

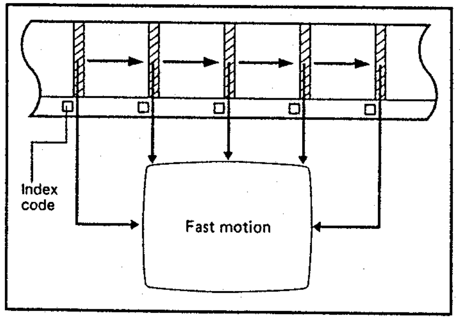
In the Play or Still mode, press ERASE button to erase the next index code. The tape is automatically fast-forwarded and when an index code is detected, it will be erased automatically. "ERASE" (on the screen) and "INDX" (on the display panel) remains lit during the searching process and blinks during the erasing process.

Mark

In the Play or Record mode, press MARK button once to put an index code onto the tape. "MARK" (on the screen) and "INDX" (on the display panel) appear and blink during the marking process.

Notes:
- Index codes cannot be added or erased on a tape with its safety tab removed.
- The Erase mode is cancelled either after one index code has been erased or the Play mode is cancelled.
- Changing the index codes in the vicinity of switching points between SP and EP recordings will distort the pictures.

INTRO SEARCH



The Intro Search function lets you visually check the contents of each recording by playing back in fast motion a short segment of a program each time an index code is detected.

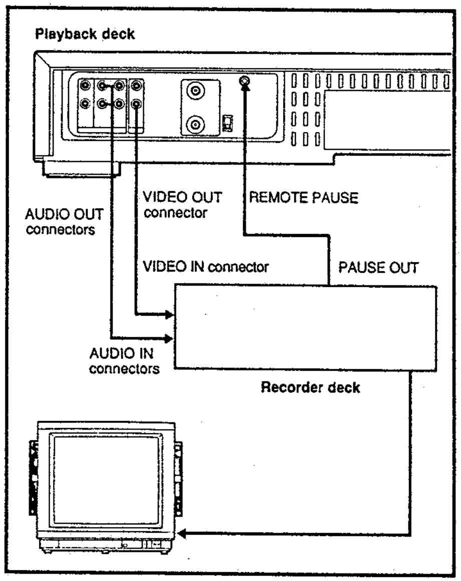
1. Press the INTRO button while in the Play or Stop mode.
   - "INDEX" will appear on the screen. (The INDX indicator on the display panel will light.)
2. Press the FF or REW button within 2 seconds.
   - The Intro Search will start in the corresponding direction.
   - Each time an index code is detected, the corresponding part is played back at the search speed (7 times normal is SP and 21 times normal in EP mode) for about 5 seconds.
3. When you find the section you want to view, simply press the PLAY button.
   - Normal playback will start.

TAPE-TO-TAPE EDITING

Tape-to-tape editing is possible using a 2nd video deck or a VideoMovie camcorder (with playback facility). Compact VideoMovie recordings can also be edited just like regular VHS cassettes through use of a cassette adapter.

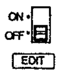
EDITING TO OR FROM ANOTHER VIDEO RECORDER

This video recorder can be used as either the recording deck or the source player when editing tapes. This VCR's REMOTE PAUSE terminal is designed to accept a preroll command when used as a source player with a video deck which is preroll-capable and equipped with a Pause Control Output terminal. This combination makes possible synchronized preroll editing for high-quality editing results.



Tips for obtaining better results

The quality of the edited tape may vary depending on the position of the EDIT switch. It is recommended that you first make some trial recordings.



- With the EDIT switch of the playback deck set to ON and recording deck to OFF.
- With the EDIT switch of both playback and recording decks set to ON, and
- With the EDIT switch of both decks set to OFF.

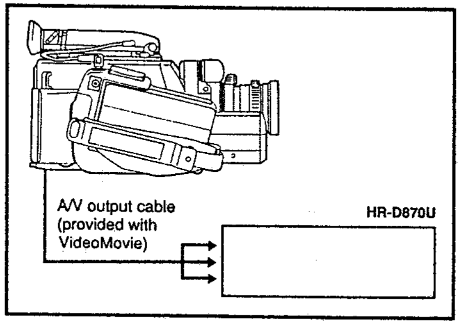
Choose the setting combination that best suits your preference.

Note: Also refer to the instruction manual of the 2nd video recorder you are using.

Connection
- Connect the player's VIDEO OUT and AUDIO OUT connectors to the recorder's VIDEO IN and AUDIO IN connectors.

Operation
- Set the recorder's input mode to AUX.
- Put the player in the Play mode.
- Put the recorder in the Record mode.

Note:
- If you do not want the On-Screen mode indications to be recorded on the dubbed tape, set "ON-SCREEN" on the VCR SET UP menu to "OFF".



EDITING FROM A VIDEOMOVIE CAMCORDER

- Connect the VideoMovie's AV OUT connector to the HR-D870U's VIDEO IN and AUDIO IN connectors.
- Connect the mini-plug of the AV output cable to the REMOTE PAUSE terminal of the HR-D870U.
- If the VideoMovie is equipped with a Master Edit Control system, you can control the recorder with the VideoMovie's controls for making edits free of transition-point gaps and distortion. Refer to the VideoMovie's instruction manual for detailed operating procedures for editing.
- With this connection, you can also use the VideoMovie as a video camera for direct recording onto the HR-D870U's tape. Put the recorder in the Record-Pause mode and operate the VideoMovie's start/stop trigger to start and pause recording. (For direct recording with a separate video camera, a camera adapter is necessary.)

E-E (Electric-Electric) monitoring

The TV MONITOR button serves as an E-E monitor button when editing. While playing back a tape on the recorder, you can also check the contents of the player's tape by pressing the TV MONITOR button without stopping the recorder's tape. To return to the recorder's tape, press the TV MONITOR button again.

DUET EDITING

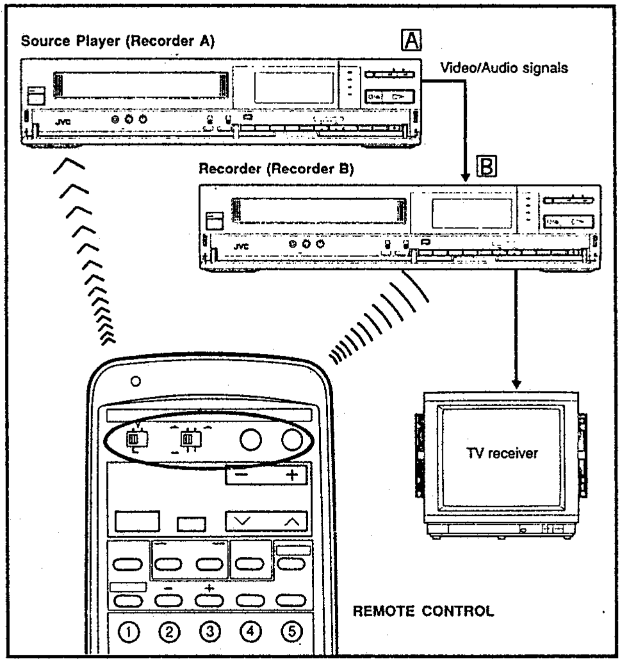
Designed specifically to simplify editing operations, the Duet Editing function delivers separate commands to two recorders simultaneously via a single remote control, taking advantage of the A/B code system. (JVC dedicated models only.)

Preparations

- Connect two recorders as described in "TAPE-TO-TAPE EDITING" on page 34.
- Set one recorder to respond to A code signals, the other, to respond to B code signals. (See page 11.)
- Place the two recorders side by side.

Notes:

- JVC video recorders with infrared remote control units which are not equipped with an A/B code select switch are designed to receive A code signals. Therefore, Duet Editing is possible with most JVC decks if the HR-D870U is set to respond to B code signals.
- It is not possible to perform Duet Editing unless the remote control's clock has previously been set.



OPERATION

Remote Control	Recorder A (Source player)	Recorder B (recorder)
	Load a recorded tape.	Load a blank tape.
1. Set the DUET EDITING ON/OFF switch to ON and the RCU CODE A/B switch to "A → B".		
2. Press STANDBY.	Enters STILL mode.	Enters RECORD-PAUSE mode.
3. Search for an edit-in point on the source tape. Press PAUSE/STILL.	Functions as commanded. (In this state, only recorder A responds to the remote control's commands.)	Remains in RECORD-PAUSE mode.
4. Press START.	Enters PLAY mode.	Enters RECORD mode.
5. Press PAUSE/STILL	Enters STILL mode.	Enters RECORD-PAUSE mode.
6. Repeat steps 3, 4 and 5 to continue editing.		

Notes:

- You can use Recorder B (the recorder set to respond to B code signals) as source player and Recorder A as a recorder. In this case, set the RCU CODE A/B switch to the "B → A" position.
- To cancel the Duet Edit mode and return to normal remote control functions, reset the DUET EDITING ON/OFF switch to OFF.
- When the START button is pressed, the recorder takes a few seconds before actual editing starts due to the automatic backspace editing system. At the same time the START button is pressed, the player starts playback from the specified edit-in point. Therefore, it is recommended that you specify a point slightly before the intended edit-in point in step 3 for more accurate editing. This also ensures that the picture of the resulting edit will be more stable.

IN CASE OF DIFFICULTY

POWER AND TAPE TRANSPORT PROBLEMS

Symptoms	Check points
No power is applied to the recorder.	• Is the power cord disconnected? — Connect it.
Clock is functioning properly, but the recorder cannot be powered.	• Is the TIMER indicator lit on the FDP? — Press the TIMER button to turn off the indicator.
Tape does not run during recording.	• Is the PAUSE/STILL indicator lit? — Press the PLAY button
Tape stops in the Rewind or Fast-Forward mode.	• Is the COUNTER MEMORY button pressed? — Press to make M disappear from the display panel.
Tape will not rewind or fast forward.	• Is the tape already fully rewound or fast forwarded? — Check the cassette.

RECORDING PROBLEMS

Symptoms	Check points
Recording cannot be started.	• Is a cassette loaded? • Is the safety tab on the cassette removed? — Reseal the slot with cellophane tape.
TV broadcasts cannot be recorded	• Has "AUX" been selected? — Set to the desired channel.
Camera recording is not possible.	• Are the camera and the camera adapter correctly connected? • Is the power switch of the camera adapter set to ON? • Has "AUX" been selected? — Set to "AUX".
Timer recording is not possible.	• Have you set the clock correctly and programmed the timer correctly? — Check once again. • Is the TIMER indicator lit on the display panel? — If not, press the TIMER button to light the indicator.

PLAYBACK PROBLEMS

Symptoms	Check points
Playback picture does not appear while the tape is running.	• If you are using RF OUT connection, is the TV receiver's channel selector set to the correct video channel? — Set it to the RF converter channel. (See page 14.) • If you are using AV connection, is the television engaged in the AV mode? — Operate the television's mode.
Playback is repeated.	• Is "REPEAT on the VCR SET UP menu set to either "FULL" or "SEGMENT"? — Set it to "NO".
Noise appears during search and still pictures.	• This is normal.
Noise appears during normal playback.	• Is the automatic tracking mode engaged? — Engage the manual tracking mode. (See page 22.)
Noise appears during slow and still playback.	• Is the automatic tracking mode engaged? — Engage the manual tracking mode. (See page 22.)
Playback picture is blurred or interrupted while TV broadcasts are clear.	• Video heads may be dirty. — Head cleaning is necessary. Consult your JVC dealer.

Continued on next page . . .

HI-FI AUDIO PROBLEMS

Symptoms	Check points
Breaks are noticeable in Hi-Fi audio reproduction.	• Is the automatic tracking mode engaged? — Engage the manual tracking mode. (See page 22.)
Soundtrack on the Hi-Fi audio track cannot be reproduced.	• Is "NORM" on the display panel? — Press the AUDIO MONITOR button to obtain "Hi-Fi".
Audio level indicators do not function.	• Is "LEVEL INDICATOR" set to OFF on the VCR SET UP menu? — Set it to ON.

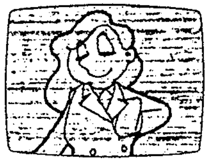
OTHERS

Symptoms	Check points
Whistling or howling is heard from TV during recording.	• Move camera's microphone away from TV or reduce TV sound volume.
Clock setting is not possible.	• Is the TIMER indicator lit on the display panel? — Press the TIMER button to turn off the indicator.
Some channels are skipped over when scanning channels.	• Those channels are preset to be skipped over. If you need them, restore them. (See page 19.)
Channel cannot be switched.	• Is recording in progress? — Press the PAUSE/STILL button, select a desired channel and press the PLAY button.
Snowy picture on screen when viewing TV programs while recording another program.	• Is the VIDEO indicator on? — Press the TV/VIDEO button so that the indicator extinguishes. (With AV connection with the RF output channel select switch set to OFF, the indicator and the TV/VIDEO button have no effect.)
Remote control does not function.	• Batteries are discharged. — Replace with new ones. • Is the A/B CODE switch set to the proper code for the recorder being operated? — Reset the A/B CODE switch to the correct setting.
Index Search does not function properly.	• Adjacent index codes may be too close to each other. — Erase some index codes and mark new ones, if necessary, with sufficient distance between two index codes.
Operating sound is audible during recording, playback, rewind, fast forward, etc.	• This is normal because VCRs incorporate motors, rotary head assembly, etc. for their operation.

This recorder contains microcomputers. External electronic noise or interference could cause malfunctioning. In such cases, switch the power off and unplug the power cord. Then plug it in again and switch on. Take out the cassette. After checking the cassette, operate the unit as usual.

HEAD CLEANING

- Picture playback may become blurred or interrupted while the TV programme received is clear. This does not mean that the recorded programme has been erased.



- Dirt accumulated on the video heads after long periods of use causes such troubles. In this case, head cleaning requiring highly technical care is necessary.
- For head cleaning, consult the nearest JVC dealer.

SECTION 1
DISASSEMBLY AND MECHANISM ADJUSTMENTS

1.1 DISASSEMBLY

1.1.1 Top cover

1. Refer to Fig. 1-1-1 and set for the EJECT (Stop) mode and disconnect VCR from AC power.
2. Take out 4 screws Ⓐ . To remove the top cover, slide in direction of arrow and lift away.

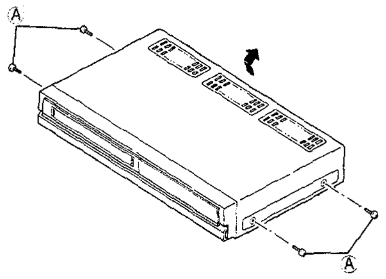


Fig. 1-1-1 Top cover

1.1.2 Front panel assembly

1. Remove the top cover.
2. Carefully disengage 3 tabs Ⓑ of the front panel assembly from the upper side of the chassis.
3. Refer to Fig. 1-1-2 and pull the front panel assembly toward you to disengage 3 tabs Ⓒ of the front panel assembly from the bottom side of the chassis, then remove the front panel assembly.

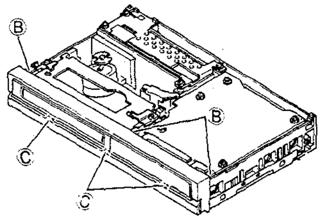


Fig. 1-1-2 Front panel assembly

1.1.3 Bottom cover

1. Remove the top cover.
2. Remove 4 screws and 4 feet Ⓓ1 from bottom cover of the VCR.
3. Refer to Fig. 1-1-3 and take out one screw Ⓓ from the bottom cover of the VCR.
4. Disengage the bottom cover from 4 claws Ⓔ on the sides of the chassis.
5. Lift the rear of bottom cover to clear chassis projections and slide bottom cover towards back of chassis, to disengage 3 tabs Ⓕ from slots in chassis. Remove bottom cover in direction of arrow. Note position of tabs, because they must mate with slots in chassis when reinstalling bottom cover.

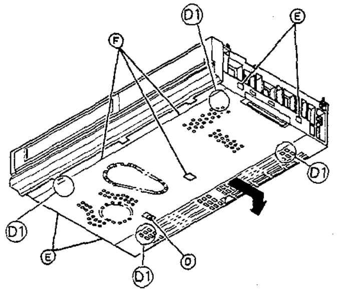


Fig. 1-1-3 Bottom cover

1.1.4 Main board assembly

1. Remove the top cover.
2. Refer to Fig. 1-1-4 and take out 5 screws Ⓖ and Ⓗ from main board assembly.
3. Remove the main board assembly in the upward direction.

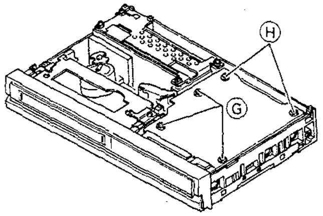


Fig. 1-1-4 Main board assembly

1.1.5 Cassette housing

1. Remove the top cover and main board assembly.
2. Refer to Figs. 1-1-5 and 1-1-6.
   Take out 4 screws Ⓘ that secure the cassette housing.
3. Disengage 3 tabs Ⓙ of the front panel and pull the front panel forward where it does not interfere with removing the cassette housing.
4. Remove the cassette housing in the upward direction.

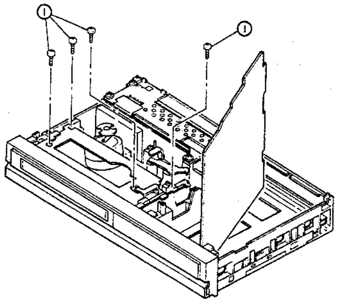


Fig. 1-1-5 Cassette housing-1

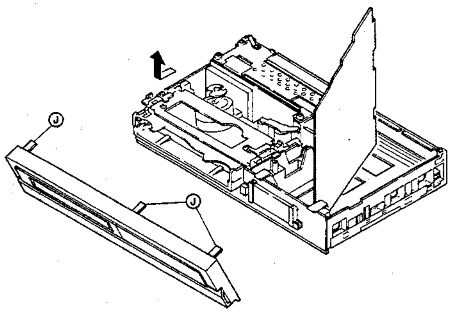


Fig. 1-1-6 Cassette housing-2

1.1.6 Cassette housing installation

1. On the main deck, observe the positional relationships of the parts indicated in Fig. 1-1-7.
   If necessary, turn the loading motor by hand to obtain these positions.

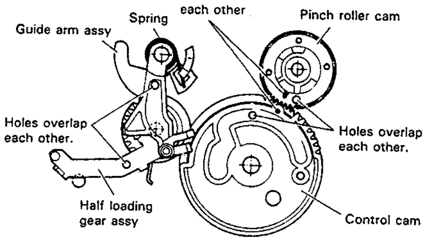

Holes face each other
Spring
Pinch roller cam
Guide arm assy
Holes overlap each other.
Holes overlap each other.
Half loading gear assy
Control cam

Fig. 1-1-7 Cassette housing installation-1

2. Refer to Fig. 1-1-8 and confirm that the clutch is engaged. If necessary, press the lever indicated by the arrow to where the clutch is locked.

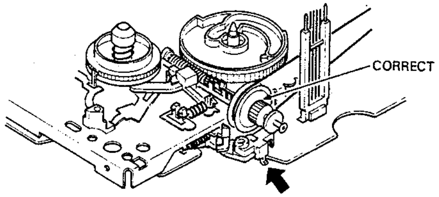


Fig. 1-1-8 Cassette housing installation-2

3. Check that the cassette housing is in the eject state (internal holder of the cassette housing is locked in raised position).
   Set the cassette housing into place and secure with 4 screws.
4. Install the front panel as shown in Fig. 1-1-9 and re-engage the tabs. Supply power and use a spare cassette to check for normal loading and eject operations.

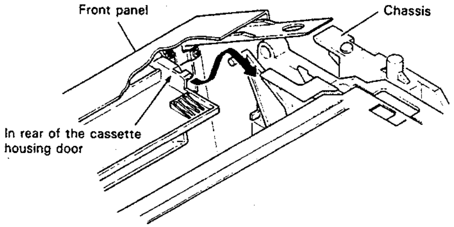

Front panel
Chassis
In rear of the cassette housing door

Fig. 1-1-9 Front panel installation

5. Disconnect VCR from power, then reinstall the main board assembly and top cover.

1.1.7 Cassette housing door

1. Remove the top cover and front panel assembly.
2. Take out one screw Ⓚ of the front panel assembly.
3. Refer to Fig. 1-1-10 and use care regarding the torsion spring, then pull out the left end of the cassette housing door to remove it.

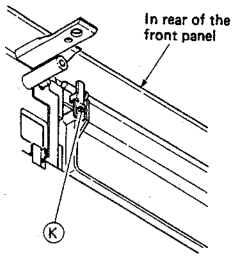

In rear of the front panel
Ⓚ

Fig. 1-1-10 Cassette housing door

1.1.8 Main-deck

1. Remove the top cover, front panel assembly and main board assembly.
2. Refer to Fig. 1-1-11 and take out 3 screws Ⓛ from the main-deck assembly.
3. Remove the main-deck assembly in the upward direction and disconnect connector CN1 from the DECK TERMINAL board, connectors CN1, CN2, CN4 from the Pre/Rec board, connectors CN1 from the A/C head board, connector CN1 from the Loading MDA board and connector CN1 from the Drum MDA board.

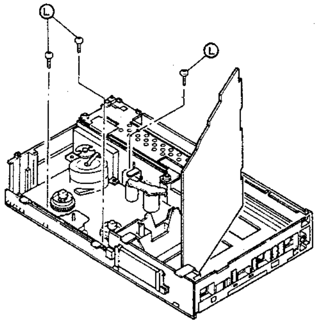


Fig. 1-1-11 Main deck

1.1.9 Video unit board assembly

1. Remove the top cover and main board assembly.
2. Refer to Fig. 1-1-12. Unsolder the video unit board assembly from main board assembly.
   Pull it downward.

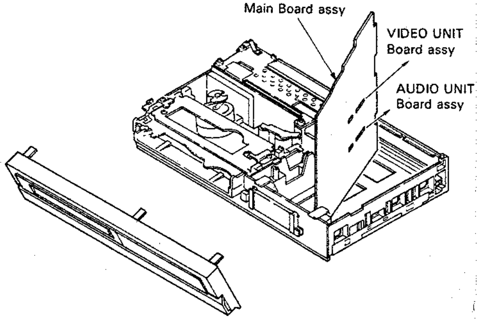

Main Board assy
VIDEO UNIT Board assy
AUDIO UNIT Board assy

Fig. 1-1-12 Video unit and Audio unit board assy

1.1.10 AUDIO UNIT board assembly

1. Remove the top cover and main board assembly.
2. Refer to Fig. 1-1-12. Unsolder the audio unit board assembly from main board assembly.
   Pull it downward.

1.1.11 Switching regulator board assembly

1. Remove the top cover.
2. Refer to Fig. 1-1-13 and take out 4 screws Ⓜ from switching regulator board assembly.
3. Remove the switching regulator board assembly in the upward direction.

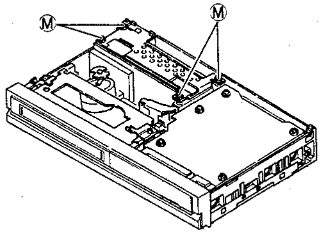


Fig. 1-1-13 Switching regulator board assembly

1.1.12 Pre/Rec board assembly

1. Remove the top cover.
2. Refer to Fig. 1-1-14 and take out shield case and 2 screws Ⓝ from pre/rec boad assembly.
3. Remove the pre/rec board assembly in the upward direction.

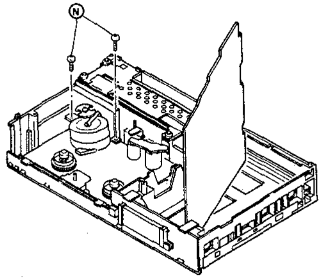


Fig. 1-1-14 Pre/rec board assembly

1.1.13 Deck Terminal board assembly

1. Remove the top cover and bottom cover.
2. Refer to Fig. 1-1-15 and take out 4 screws Ⓟ from deck terminal board assembly.
3. Unsolder D1 , S3 , S2 from deck terminal board assembly.
4. Remove the 2 hooks Ⓡ and connectors from deck terminal board assembly. Very carefully, remove the deck terminal board assembly in the downward direction.

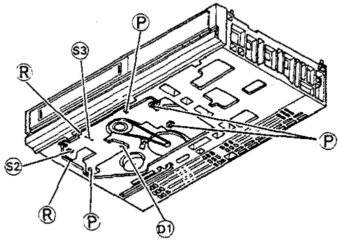


Fig. 1-1-15 Deck terminal board assembly

1.2 MECHANISM ADJUSTMENTS

1.2.1 Precautions

1. Disconnect mainframe from AC power before soldering.
2. Avoid imparting stress to wires when disengaging connectors.
3. Determine and correct the cause of difficulty before proceeding to adjustments. Do not disturb settings unnecessarily.
4. Use care not to damage tabs, claws, etc. during repairs.
5. Install the cassette housing assembly only when the mechanism is in the Eject or Stop mode position. In the Eject mode, the internal holder of the housing is fully raised. This is fully lowered in the Stop mode.
6. When installing the front panel assembly, be sure to engage the housing door with the door lever of the cassette housing assembly. If this step is omitted, the door will not open at Eject and the cassette cannot be removed.

1.2.2 Check without cassette housing

Mechanism operations can be observed easily by removing the cassette housing assembly. Note the following.

1. Disable the photo transistor sensor (END SENSOR) on the main-deck by applying an opaque cover.
2. Connect pins 2 and 3 of Main board connector CN601.
3. Select the desired modes with the operation buttons. However, notice that without tape, setting for the reverse direction modes produces the Stop mode after a few seconds due to absence of the reel sensor output.

1.2.3 Manually removing cassette tape

In event of electrical system failure that prevents the tape from being unloaded, the tape can be removed manually by the following procedure. Refer to Figs. 1-3-1, 1-3-2 and 1-3-3.

1. Disconnect power cord from AC outlet.
2. Turn the loading motor by hand so that the control cam rotates clockwise. This retracts the pole base assembly to the unloading position.
3. Continue turning to where the guide arm and half loading gear assemblies shift to beneath the cassette.
4. Turn the clutch assembly at the rear of the deck to absorb slack tape within the cassette.
5. Again turn the loading motor in the same direction to raise the cassette and remove it.

1.2.4 Test equipment

The following special tools and fixtures are required for mechanism adjustment.

1. Alignment tapes : MH-1 (SP) and MH-1L (EP)
   Stairstep signal is employed for interchangeability checks and adjustments.
2. Torque gauge : PUJ48075-2
   Measures tape take-up torque.
3. Back tension cassette gauge : PUJ48076-2
   Measures tape tension at the supply side.
4. A/C head positioning tool : PUJ47351-2
   Shifts the head base for adjusting the control head position.
5. Roller driver : PTU94002
   Turns the guide roller for adjusting FM linearity.
6. Presetting unit : PTU94008
   Use for EP auto tracking preset adjustment.

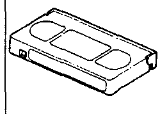
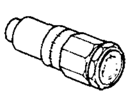
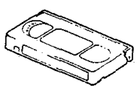
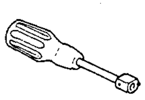
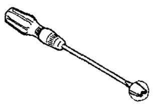
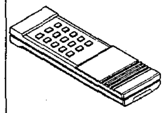
1 Alignment tape	2 Torque gauge	3 Back tension cassette gauge	4 A/C head positioning tool	5 Roller driver	6 Presetting unit
					

Fig. 1-2-4 Test equipment

1.3 MAIN MECHANISM PARTS

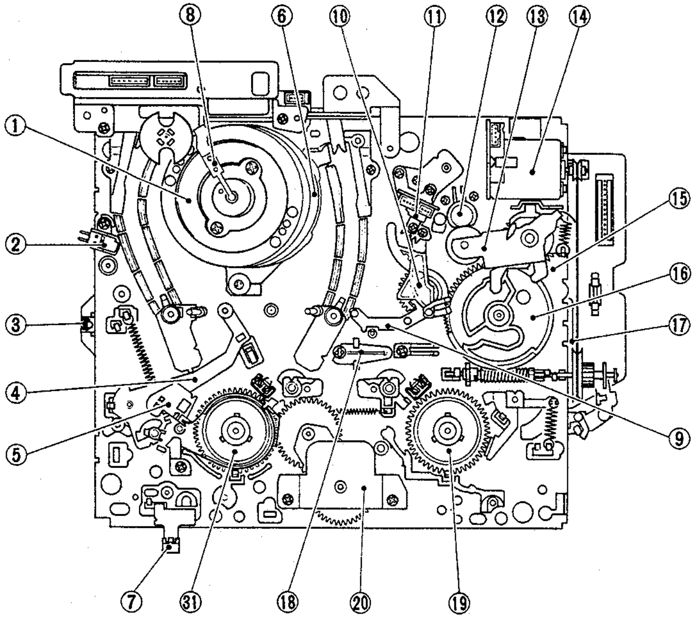


Fig. 1-3-1 Top view of main-deck

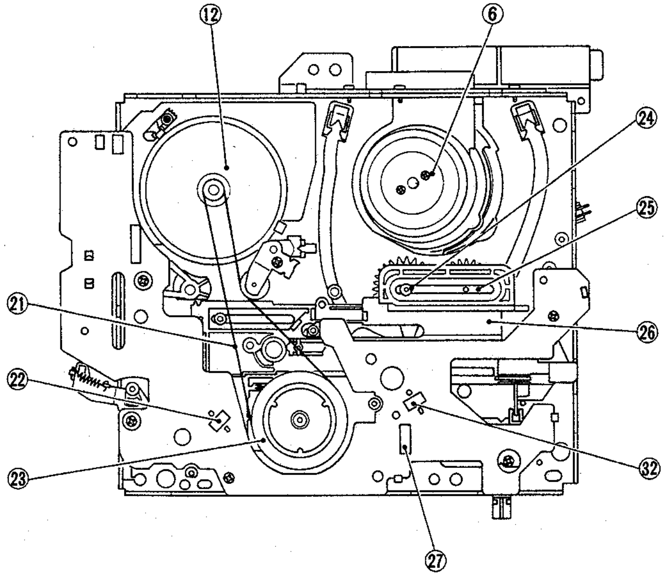


Fig. 1-3-2 Bottom view of main-deck

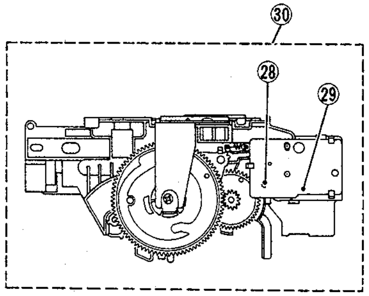


Fig. 1-3-3 Side view of cassette housing

A. Cleaning

Periodic cleaning of the tape transport system is desirable, but ordinarily not feasible in practice. Therefore, perform cleaning when a set is brought in for repairs or maintenance. Contamination of the video heads, tape guides and brushes can detract from playback picture quality and in extreme cases, even damage the tape. For cleaning, use a fine-mesh cotton cloth (about the texture of a white dress-shirt) moistened in alcohol.

- To clean the video heads, press the moistened cloth gently against the upper drum with fingertip and turn the drum by hand.
- Do not use a vertical stroke, as this may damage the heads.

B. Lubrication

Oil and grease do not normally require periodic replenshing. Apply only when replacing lubricated parts (also clean and replace lubrication of mating parts if soiled).

For parts and points to apply oil and grease, refer to the exploded views of the mechanism assembly.

Before oiling, clean with alcohol.
Apply one or two drops of oil. Avoid excess oil.

1. Table 1-1 indicates the oil and grease used in this set. Use these or recommended locally available equivalents.

No.	Parts No.	Category
1	COSMO-HV56	Oil
2	KANTO-G-31KAV	Grease

Table 1-1

2. Grease is not required for a replacement cassette housing assembly, as this has been applied at the factory.

Notes: ***Stir grease that has been stored for an extended period.***

C. Main mechanical parts

See Figs. 1-3-1, 1-3-2 and 1-3-3.

No.	Symbol	Parts Name	See Section
1	M32A	Upper drum assy	
2	M44	Full erase head	
3	51Q1	End sensor	
4	M41	Tension arm assy	1.5.4
5	M42	Tension band assy	1.5.4
6	M32C	Lower drum motor assy	1.5.2
7	M461	REC safety switch	
8	M32D	Brush assy	
9	M449	Half loading gear assy	1.5.5
10	M447	Guide arm assy	1.5.5
11	M48	A/C head	1.5.3
12	M422	Capstan motor	
13	M442	Pinch roller arm assy	
14	M434	Loading motor assy	
15	M446	Pinch roller cam	1.5.5
16	M438	Control cam	1.5.5
17	M437	Loading belt	
18	M460	LED holder (D1)	
19	M430	Reel disk (take-up)	
20	M424	Idler gear assy	
21	M429	Timing belt	
22	51PHS1	Take up reel sensor (PHS1)	
23	M426	Clutch assy	1.5.6
24	M433	Take up loading arm assy	1.5.7
25	M432	Supply loading arm assy	1.5.7
26	M439	Plate assy	1.5.7
27	M462	Slide switch (S3)	
28	56PHS3	Cassette sensor (PHS3)	
29	56Q2	Start sensor (Q2)	
30	M36	Cassette housing assy	
31	M470	Reel disk (supply)	
32	51PHS2	Supply reel sensor (PHS2)	

- Symbol interpretation example

M32A
└ Ref. No.
└ Exploded view symbol

56 Q2
└ Ref. No.
└ Board No.

1.4 INSPECTION AND MAINTENANCE

This product employs rotary and moving parts which wear in the course of usage. Periodic inspection, cleaning, lubrication and maintenance are therefore important for ensuring maximum performance. Worn parts must also be replaced when required.

1.4.1 Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning, lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions. However, the indicated components should be inspected when a set is brought in for service and the maintenance work performed if necessary.

Also note that rubber parts may deform in time, even if the set is not used.

System	No.	Parts Name	Symbol No.	Periodic servicing schedule (operation hours)								
				250	500	750	1000	1250	1500	1750	2000	3000
Tape Transport system	1	Upper drum assy	M32A	★	★	☆	●	★	★	☆	●	●
	11	A/C head	M48	★	★	★	★	★	★	★	☆	●
	13	Pinch roller arm assy	M442	★	★	★	★	★	★	★	★	●
	2	Full erase head	M44	★	★	★	★	★	★	★	★	●
	4	Tension arm assy	M41	★	★	★	★	★	★	★	★	★
	6	Lower drum motor assy	M32C									
	12	Capstan (shaft) motor	M422									
	9	Half loading gear assy	M449									
	10	Guide arm assy	M447									
Drive system	12	Capstan motor	M422								●	
	17	Mode Belt	M437				○				●	○
	21	Timing Belt	M429				○				●	○
	19	Take-up reel disk	M430				△				△	●
	31	Supply reel disk	M470				△				△	●
	23	Clutch unit	M426						○		○	○
	14	Loading motor assy	M434									●
Others	5	Tension band	M42				○				○	○
	8	Brush	M32D				○				○	○

★ : Cleaning

☆ : Cleaning (or Replacement if necessary)

△ : Lubrication

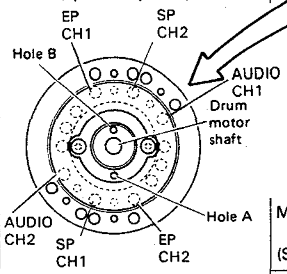
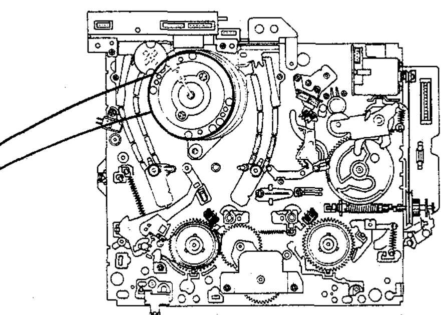
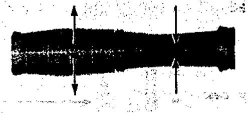
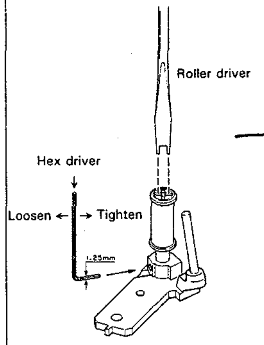
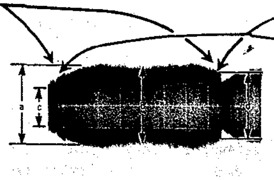
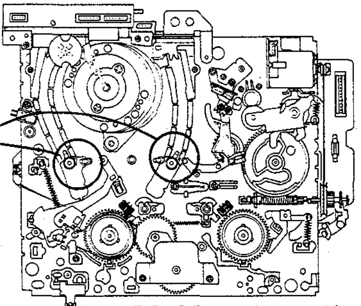
▲ : Lubrication (or Replacement if necessary)

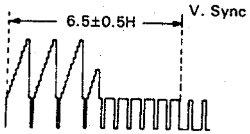
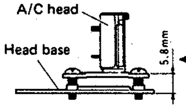
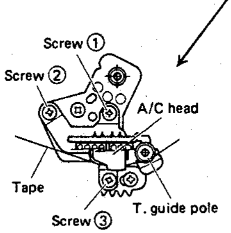
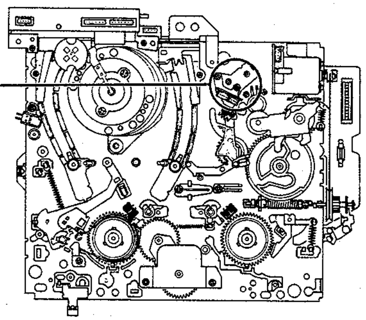
● : Replacement

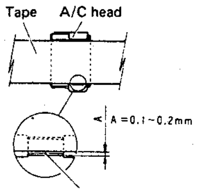
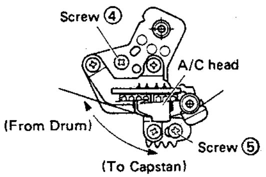
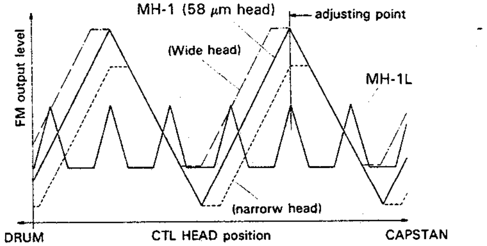
○ : Inspection (or Replacement if necessary)

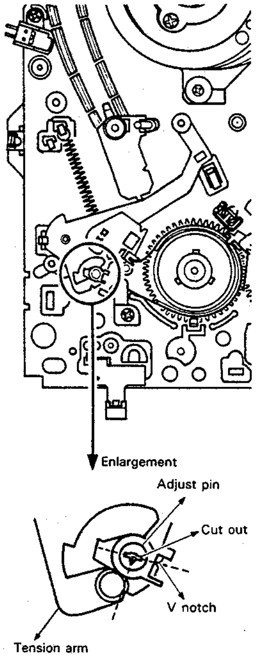
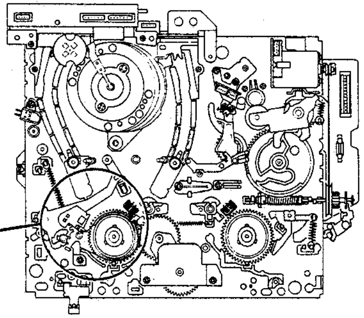
Table 1-4-1 Approximate maintenance schedule

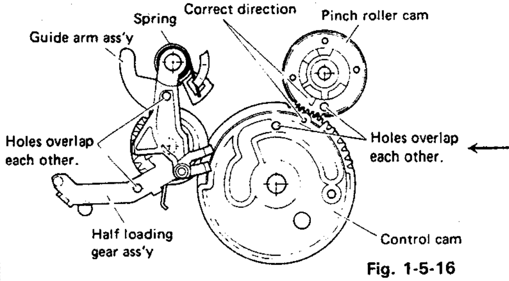
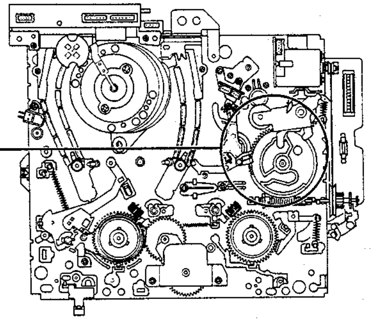
1.5 MAIN PARTS REMOVAL AND REPLACEMENT

No.	Item	Checkpoints	Adjustment and Checks
1	Upper drum assembly •Symptoms: FM signal absent, intermittent or weak on one channel; large difference in channel output levels •Cause: Worn or damaged video heads, poor response, etc.  EP CH1 SP CH2 Hole B AUDIO CH1 Drum motor shaft AUDIO CH2 Hole A SP CH1 EP CH2 **Fig. 1-5-1** DRUM TOP VIEW	 **Fig. 1-5-2** Drum Position	
		Mounting direction See Fig. 1-5-1. (Symptom: no picture)	After replacing, observe that upper drum hole A is opposite the motor axis from lower drum hole B.
		Axis wobble See Fig. 1-5-2. (Symptom: jitter, poor FM linearity) PB FM: Main board TP206 FF: Main board TP411	Record and playback in EP mode. Confirm absence of large difference between channels. (Fig. 1-5-3)  **Fig. 1-5-3** Axis wobble
	 **Fig. 1-5-4** S.T. Pole base	FM linearity check See Fig. 1-5-5. (Symptom: vertical sync absent, picture noise) PB FM: Main board TP206 FF: Main board TP411  **Fig. 1-5-5** FM linearity $\frac{b}{a} \geqq 0.7, \frac{c}{a} \geqq 0.65, \frac{d}{a} \geqq 0.65$	 **Fig. 1-5-6** S.T. Pole base position 1) Play stairstep signal of the MH-1 Alignment Tape. Confirm absence of obvious FM waveform loss and that operating the Tracking yields the optimum point. 2) Refer to Fig. 1-5-4, adjust for loss at the left edge (drum entry) of the FM waveform by turning the guide roller of the supply pole base. Similarly, adjust for loss at the right edge (drum exit) by turning the guide roller of the take-up pole base. **Note:** ***If FM loss occurs on both channels and cannot be corrected by adjusting the guide rollers, the lower drum needs replacement.***

No.	Item	Checkpoints	Adjustment and Checks
	PB switching point •Symptom: switching noise at picture bottom.	VIDEO OUT or TP252 (Main board)  **Fig. 1-5-7** PB Switching Point	1) Connect VCR to AC. Turn power on. 2) Connect an oscilloscope to VIDEO OUT or TP252. 3) Insert the MH-1 alignment tape to the cassette housing. Play back the stairstep segment of MH-1 alignment tape. 4) Trigger the oscilloscope externally (−slope) with the signal from TP411 (DRUM FF) of the main board. 5) Adjust R427 to position the trigger point 6.5 H ±0.5 H from V. sync as shown in Fig. 1-5-7.
2	Lower drum assembly •Symptoms: Poor FM linearity, noisy rotation, jitter •Cause: Lead and bearing wear	Check FM linearity and switching point.	See above upper drum assembly items.
		Check control head phase (X value) Symptom: tracking error PB FM: Main board TP206 FF: Main board TP411	1) Play stairstep signals of MH-1 and MH-1L Alignment Tapes. Engage the Tracking Preset mode by pressing the + and − buttons simultaneously in the onscreen mode. Confirm that the same maximum FM waveform level is obtained as when the tracking is adjusted manually. 2) Refer to the A/C head adjustments.
3	A/C head  **Fig. 1-5-8** Temporary height  Screw ① Screw ② A/C head Tape Screw ③ T. guide pole **Fig. 1-5-9** Inclination/Azimuth/ Height adj.	 **Fig. 1-5-10** A/C HEAD position	
		Temporarily set height as indicated in Fig. 1-5-8.	Set the height as indicated in Fig. 1-5-8 to facilitate tape transport checks and adjustments.
		Tilt (forward inclination) See Fig. 1-5-9. (Symptom: audio level varies greatly.)	1) Run tape, turn screw ① counterclockwise to where slight curling of the tape occurs at the lower flange of the take-up guide roller. 2) Then slowly turn the screw clockwise to where the curling ceases.
		Azimuth See Fig. 1-5-9. (Symptoms: audio low level or noisy) Audio output: Main board AUDIO OUT	1) Set front panel AUDIO MONITOR selector to Normal and play stairstep signal (with audio 7 kHz) of the MH-1 Alignment Tape. Observe audio output signal with oscilloscope. 2) Turn screw ② and adjust for maximum audio output level.

No.	Item	Checkpoints	Adjustment and Checks
	 **Fig. 1-5-11** Height Adj	Height See Figs. 1-5-9 and 1-5-11. (Symptom: low audio and control signal levels)	1) Run tape and observe the control head area. 2) Turn screws ①, ② and ③ by small and equal amounts until 0.1 to 0.2 mm of the head core bottom can be seen. **Note:** *If difficult to observe, play stairstep signal of MH-1 Alignment Tape and adjust for maximum audio output and control pulse level.*
		FM linearity	Refer to upper drum assembly items. If adjustment is major, again check the azimuth.
	 Screw ④ A/C head (From Drum) Screw ⑤ (To Capstan) **Fig. 1-5-12** CTL head phase  **Fig. 1-5-13** CTL head phase **Note:** *Trigger the oscilloscope externally signal from TP411 (DRUM FF). Use (+) trigger for MH-1 and MH-1L alignment tape.*	Control head phase See Fig. 1-5-12 PB FM: Main board TP206 FF : Main board TP411	1) Play stairstep signal of MH-1 Alignment Tape and observe the FM waveform. Set for Tracking Preset by pressing the + and − buttons simultaneously in the onscreen mode. 2) Loosen screws ④ and ⑤. Set the A/C head positioning tool on screw ④, with the stud inserted into the nearby oblong hole. 3) Turn the tool first to position the A/C head fully toward the capstan. Then gradually return it toward the drum and stop at the position of maximum FM waveform output level as shown in Fig. 1-5-13. 4) Tighten screw ⑤ . Remove the tool and tighten screw ④. 5) Play stairstep signal of MH-1L Alignment Tape and confirm maximum FM waveform output level as shown in Fig. 1-5-13. 6) If not maximum, slightly loosen screws ④ and ⑤. Use the tool and adjust the head position for the nearest maximum point. Then tighten screws ④ and ⑤.
		EP auto tracking adjustment	1) Terminate the video output at 75 ohms with a monitor-TV and connect oscilloscope to PB FM (TP206). 2) Set MH-1L Alignment Tape into the cassette housing and play the stairstep signal. 3) Confirm that the A/V digital tracking LED changes from flashing to lighted. 4) Press button "D" of the preset unit (PTU 94008) to extinguish the A/V digital tracking LED. 5) Again press button "D" to enter the EP interchangeability adjust mode. Confirm that the A/V digital tracking LED changes from flashing to extinguished. Press the stop button. **Note:** *If the Alignment Tape ejects automatically, repeat the control head phase adjustment.*

No.	Item	Checkpoints	Adjustment and Checks
4	Tension arm assembly Tension band assembly  Enlargement Adjust pin Cut out V notch Tension arm **Fig. 1-5-14** Tension arm assy	Tension pole position See Fig. 1-5-14. (Symptom: poor FM waveform response)	 **Fig. 1-5-15** Tension arm position **Note:** ***The adjust pin is eccentric.*** 1) Set mechanism to the eject mode (Cassette housing holder fully raised) 2) As shown in the Fig. 1-5-14 turn the adjust pin to where the cut out forms a straight line with the V notch.
		Back tension (Symptom: skew)	1) When the tension pole position is correctly adjusted, the back tension will assume the correct value. 2) Use the Back Tension Cassette Gauge and set for the playback mode. Confirm reading of 35 to 48. 3) Changing the tension pole position in order to vary the back tension will cause adverse effects elsewhere.

No.	Item	Checkpoints	Adjustment and Checks
5	Pinch roller cam Control cam Half loading gear assembly Guide arm assembly  Spring Correct direction Pinch roller cam Guide arm ass'y Holes overlap each other. Holes overlap each other. Half loading gear ass'y Control cam	**Fig. 1-5-16** Control/Pinch roller cam Important: Do not remove or disturb parts other than those mentioned. See Fig. 1-5-16.	Set mechanism to Eject mode internal holder of the cassette housing is locked in raised) position.  **Fig. 1-5-17** Control cam position 1) When installing the pinch roller cam, overlap the largest hole of the gear portion with the hole of the deck. 2) Set the control cam on the deck with the hole of the groove overlapped with the hole of the deck. Observe that the small hole of the control cam and the ridge of the pinch roller cam are aligned. (If the control cam does not fit readily, shift the rear plate assembly within the range of play.) 3) Install the half loading gear assembly with the hole overlapped with the hole of the deck. Secure with E-ring. 4) Install the guide assembly over the spring and with the hole overlapping that of the deck. Engage the spring correctly.
		Cassette housing assembly	Install the cassette housing assembly with the mechanism in the Eject mode. Also observe that the inner holder of the housing is raised and locked.
6	Clutch assembly	Take-up torque (Symptom: inadequate take-up torque)	1) Remove cassette housing and set for playback mode (see Section 1.2). 2) Set torque gauge on the take-up reel disk. Gradually relax your grip on the gauge and read the needle indication at the point the gauge begins to rotate with the disk. Confirm indication of 60 to 100.

No.	Item	Checkpoints	Adjustment and Checks
7	Take-up loading arm assembly Supply loading arm assembly Plate assembly		**Note:** • ***Set mechanism to the Eject or Stop mode before removing these parts.*** • ***The flange of the plastic rivet securing the loading arm assembly and the pole base assembly can be damaged by attempting to remove it directly. Press the loading arm assembly firmly to prevent motion. Then use a narrow-shafted tool to press the rivet from the shaft end to remove it.***
		Mounting position alignment • Remove the tension arm assembly to facilitate operation. See Fig. 1-5-18.	1) Set the supply and take-up loading arm assemblies so that the holes of the gear portions are aligned, then secure to the pole base assemblies with rivets. 2) Shift the plate assembly and install with the holes of the upper and lower components overlapped.
		Slide switch See Fig. 1-5-18.	Be sure to engage the slide switch slider with the edge of the plate assembly.

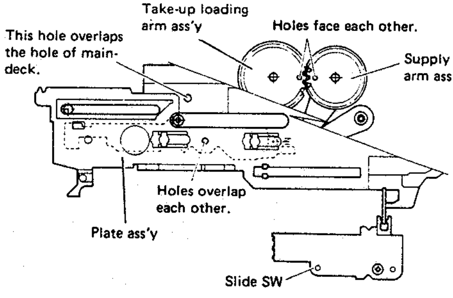

Take-up loading arm ass'y
This hole overlaps the hole of main-deck.
Holes face each other.
Supply loading arm ass'y
Holes overlap each other.
Plate ass'y
Slide SW

Fig. 1-5-18

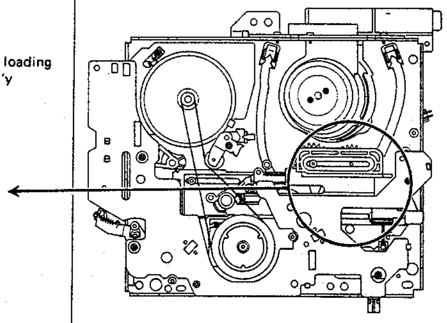


Fig. 1-5-19
T.S. Loading arm position

SECTION 2
ELECTRICAL ADJUSTMENTS

2.1 PREPARATION

Electrical adjustments are required after replacing circuit components and certain mechanical parts.
It is important to perform these adjustments only after all repairs and replacements have been completed. Also, do not attempt these adjustments unless the proper equipment is available.

2.1.1 Required test equipment

1. Color television or monitor
2. Oscilloscope: wide-band, dual-trace, triggered delayed sweep
3. Frequency counter
4. Audio oscillator
5. Audio voltmeter
6. Digital voltmeter
7. Signal generator: RF/IF sweep/marker
8. Signal generator: NTSC color bar, stairstep
9. Distortion meter
10. Recording tape
11. Alignment tapes: MH-1 (SP), MH-1L (EP)
12. Presetting unit (PTU94008)

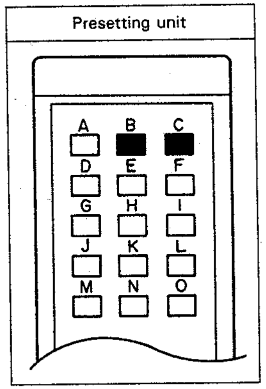

Presetting unit
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O

Fig. 2-1-4

Note: *Use only buttons "A", "B" or "C". Depressing other buttons during adjustments may cause adjustment errors.*

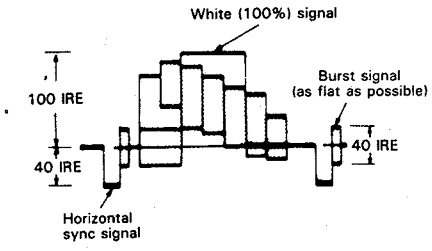

White (100%) signal
100 IRE
Burst signal (as flat as possible)
40 IRE
40 IRE
Horizontal sync signal

Fig. 2-1-1 Color bar signal of pattern generator

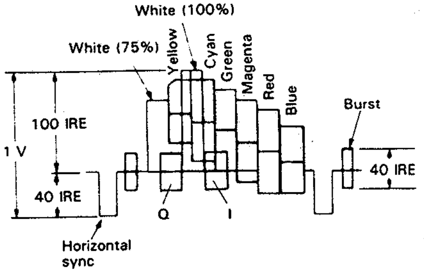

White (100%)
White (75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
100 IRE
1 V
40 IRE
40 IRE
Q
I
Horizontal sync

Fig. 2-1-2 Color bar signal waveform

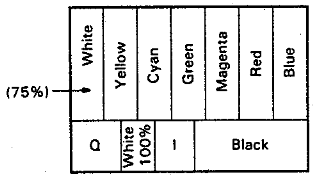

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
Q
White 100%
I
Black

Fig. 2-1-3 Color bar pattern

2.1.2 Check and adjustment steps

The check and adjustment steps are provided in the following pages in the form of charts. For clarity, the nomenclature used in the charts is outlined below.

No.	Checks and adjustments are numbered in the recommended sequence in which they are to be performed.
Item	Name assigned to the particular check and adjustment step.
Check Point	Location to which measuring instrument (oscilloscope unless otherwise noted) is to be connected.
Adjustment Parts	Variable component (resistor, capacitor, etc.) to be adjusted in this step. Dash (—) indicates check only.
Signal & Mode	• Input signal required to perform adjustment. Dash (—) indicates that special signal is not required. • Equipment operating mode at time of check or adjustment.
Color bar	Color bar signal as video input.
Stairstep	Stairstep signal as video input.
1 kHz	Supply a 1 kHz sinewave as audio input signal.
MH-1 Color bar	Play color bar segment of MH-1 alignment tape.
MH-1 Stairstep	Play stairstep segment of MH-1 alignment tape.
MH-1 1 kHz	Play 1 kHz audio signal segment of MH-1 alignment tape.
MH-1 RF sweep	Play RF sweep segment of MH-1 alignment tape.
MH-1L Color bar	Play color bar segment of MH-1L alignment tape.
MH-1L Stairstep	Play stairstep segment of MH-1L alignment tape.
MH-1L RF sweep	Play RF sweep segment of MH-1L alignment tape.
MH-1M Color bar	Play color bar segment of MH-1M alignment tape.
MH-1M Stairstep	Play stairstep segment of MH-1M alignment tape.
Stop	Power on and machine in Stop mode.
REC	Recording mode
PB	Playback mode
REC ↓ (another mode)	Use blank tape, record, then play back in the mode specified.
Search	Search (FWDS and REVS) playback mode.
Slow	Slow motion playback mode.
Still	Playback then Pause.
A DUB	Audio dubbing mode.
Description	This column provides an explanation of the step, notes, adjustment values, and reference to waveforms where applicable.

2.1.3 Confirmation

Before adjustment, use the MENU button function to set the TODAY'S PROGRAM, PROGRAM, CLOCK, VCR SET UP and TUNER SET UP.

1. Press the MENU button.
   - The following MENU appears on the monitor-TV as shown in Fig. 2-1-5.
2. The TUNER SET UP menu provides on screen display of the BAND, AFC, AUTO CHANNEL SET and MANUAL CHANNEL SET, as shown in Fig. 2-1-5.

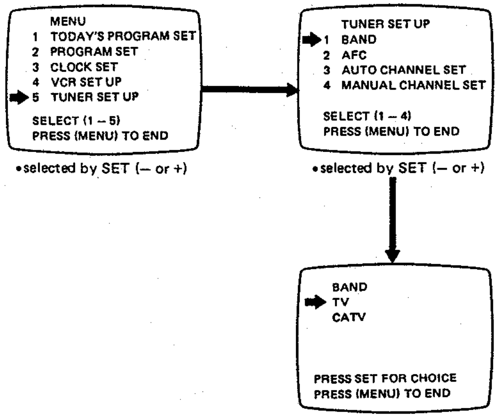
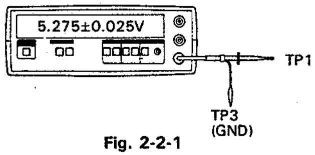
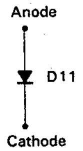
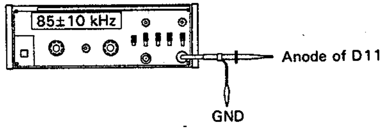

MENU
1 TODAY'S PROGRAM SET
2 PROGRAM SET
3 CLOCK SET
4 VCR SET UP
5 TUNER SET UP
SELECT (1 – 5)
PRESS (MENU) TO END
•selected by SET (– or +)
TUNER SET UP
1 BAND
2 AFC
3 AUTO CHANNEL SET
4 MANUAL CHANNEL SET
SELECT (1 – 4)
PRESS (MENU) TO END
•selected by SET (– or +)
BAND
TV
CATV
PRESS SET FOR CHOICE
PRESS (MENU) TO END

Fig. 2-1-5

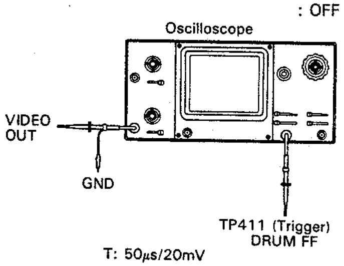
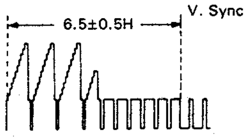
2.2 SWITCHING REGULATOR CIRCUIT

Note: ***Unless otherwise specified, all test points and adjustments are located on the SWITCHING REG board.***

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	5V DC OUTPUT	TP1 (INPUT) TP3 (GND)	R28 (SWD 5 V ADJ)	• Tuner mode • REC • SP mode	1) Insert recording video cassette to the cassette housing and set for the REC mode. 2) Connect a digital voltmeter as shown in Fig. 2-2-1. 3) Adjust R28 for 5.275±0.025 V Digital Voltmeter  5.275±0.025V TP1 TP3 (GND) Fig. 2-2-1
2	Confirmation of oscillation	Anode of D11  Anode D11 Cathode		• Tuner mode • REC • SP mode	1) Insert a recording video cassette into the cassette housing and set for the REC mode. 2) Connect a frequency counter as shown in Fig. 2-2-2. Frequency counter  85±10 kHz Anode of D11 GND Fig. 2-2-2

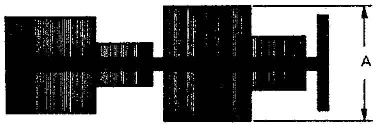
2.3 SERVO CIRCUIT

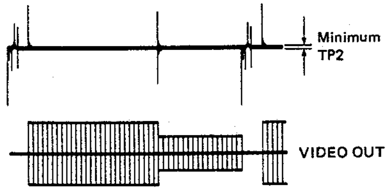
Notes: *1. Unless otherwise specified, all test points and adjustments are located on the MAIN board.*
2. T indicates the time and volts/division setting of the oscilloscope (use 10:1 probe)

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	SP PB switching point	VIDEO OUT	R427 (Switching point)	•PB •MH-1 stairstep •Trigger slope (−) •SP mode •Auto tracking : OFF	1) Connect an oscilloscope as shown in Fig. 2-3-1. 2) Play back the stairstep segment of MH-1 alignment tape. 3) Adjust R427 to position the trigger point 6.5H ±0.5H from V. sync as shown in Fig. 2-3-2.
	 Oscilloscope VIDEO OUT GND TP411 (Trigger) DRUM FF T: 50μs/20mV Fig. 2-3-1				 **Fig. 2-3-2** PB Switching Point
2	SP slow tracking preset	Monitor-TV	Presetting unit	•SP mode •Slow PB	Note: *Set VCR to A mode by remote controller.* 1) Set recording video cassette into the cassette housing. 2) Receive a color broadcast on a VHF-HI channel or supply a color bar signal to VIDEO IN. 3) Record a color broadcast or color bar signal in the SP mode. 4) Play back recorded signal in the FWD and REV slow mode and set the tracking control of the FRONT panel to the center position by simultaneously pressing the (+) and (−) tracking buttons. 5) Observe the display on a monitor-TV and adjust for optimum noise condition (best tracking) by depressing "B (−)" or "C (+)" buttons of presetting unit as required. 6) Depress the stop button on the FRONT panel. 7) Confirm that the bar noise is not visible on the monitor in the slow mode.
3	EP slow tracking preset	Monitor-TV	Presetting unit	•EP mode •Slow PB	1) In the same manner as the above SP slow mode.

2.4 VIDEO CIRCUIT

Note: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	REC color level and ch balance	IC201-5 (Video unit board)	R210 (SP Rec color level) (Main board)	• PB mode • MH-1 color bar • SP mode • Auto tracking: OFF	1) Connect an oscilloscope to IC201-5 pin and observe color signal level. 2) Insert the MH-1 alignment tape to the cassette housing, play back the color bar segment of MH-1 alignment tape. 3) Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "−" tracking buttons. 4) Adjust by pressing the "+" and "−" tracking buttons of the Front panel for maximum level of the color waveform and make a note of the higher color level "A". 5) Press the STOP button on the FRONT panel and eject the MH-1 alignment tape.
				• REC then PB color bar • Auto tracking: OFF • SP mode	6) Insert recording video cassette to the cassette housing. Supply a color bar signal to VIDEO IN. 7) Trigger the oscilloscope externally with the signal from TP411 (DRUM FF) of the Main board. Use (−) trigger for CH1 and (+) trigger for CH2. 8) Record a color bar signal in the SP mode. 9) Play back recorded color bar signal. Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "−" tracking buttons and confirm 90±5% of the noted color level at IC201-5. If necessary, before recording adjust R210 so that the higher level channel becomes 90±5% of the noted level "A" during playback as shown in Fig. 2-4-1. At this time, confirm that the channel level difference is within 5 dB. **Note:** *Repeat the above step (9) several times.*
		 **Fig. 2-4-1** REC color level			
		IC201-5	R228 (EP Rec color level) (Main board)	• EP mode • PB mode • MH-1 L color bar • Auto tracking: OFF	1) Repeat the above steps 1 to 7. 2) Record a color bar signal in the EP mode. 3) Play back recorded color bar signal. 4) Set the tracking of the FRONT panel to the Auto tracking off position by simultaneously pressing the "+" and "−" tracking buttons and confirm 85±5% of the noted color level at IC201-5.
				• EP mode • REC then PB color bar • Auto tracking: OFF	5) If necessary, before recording, adjust R228 so that the higher level channel becomes 85±5% of the noted level during playback as shown in Fig. 2-4-1. At this time, confirm that the channel level difference is within 4 dB. **Note:** *Repeat the above step (5) several times. Perform the EP mode adjustment after completing the SP mode.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
2	YNR NC balance	TP2 (IC1-26) (VIDEO UNIT board)	R31 (NC BAL) (VIDEO UNIT board)	• E-E • INPUT SEL: AUX • Color bar • SP mode	1) Supply a color bar signal to VIDEO IN and connect an oscilloscope to TP2 (IC1-26 pin). 2) Adjust R31 for minimum DC step difference.
	 Fig. 2-4-2				

2.5 AUDIO CIRCUIT

Notes: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Audio Bias Level	TP331 (INPUT) TP332 (GND)	R307 (Bias level)	•SOURCE Select: AUX •SP mode •REC mode •No signal	1) Connect a millivoltmeter between TP331 (INPUT) and TP332 (GND). 2) Set for REC mode without signal. 3) Adjust R307 for 2.1 mVrms.
2	Audio PB Level	AUDIO OUT	R309 (PB level)	•SOURCE Select: AUX •REC then PB •SP or EP mode • -8 dBs/1 kHz	1) Connect an oscilloscope to AUDIO OUT. 2) Supply an audio signal (-8 dBs/1 kHz) to AUDIO IN and record together with a video signal, then play back. 3) Adjust R309 so that the audio output level during playback becomes -6 ± 2 dBs ($^{+0.29}_{-0.22}$ Vp-p.)
3	Level Indicator	FDP (Level Ind.)	R306 (Indicator CH1/L)	•AUX •AUDIO OUT to Hi-Fi	1) Set the SOURCE SELECT switch to the AUX position. Supply a 1 kHz, -8 dBs audio signal AUDIO IN. 2) Confirm that the Audio level is -6 ± 0.5 dBs at AUDIO OUT. In the E-E (STOP) mode, adjust R306 to the point where the FDP level indicators show 0 dB (all white LEDs light).
			R305 (Indicator CH2/R)		3) In the same manner, adjust R305 for the R (CH2) channel.

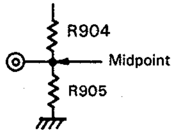
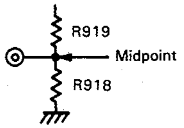
2.6 TIMER CIRCUIT

Notes: *Unless otherwise specified, all test points and adjustments are located on the TIMER/DISPLAY/SWITCH board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	Clock	IC 701-37	C712 (Clock)	• EE	1) Connect a frequency counter between IC701-37 and GND. 2) Short IC701-18 to GND, then short the leads of electrolytic capacitor C702 once in order to reset IC701. All FDP Segments and power LED are off. 3) Adjust C712 for 2048.000 ± 0.002 Hz (488.2808 to 488.2818 μs).

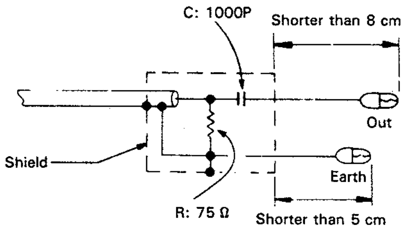
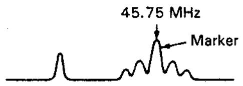
2.7 ON SCREEN CIRCUIT

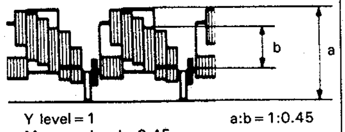
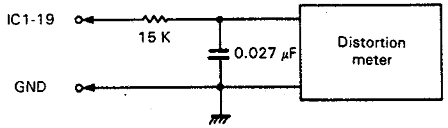
Note: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
1	DOT CLOCK	TP901  Fig. 2-7-1	C905 (Dot clock)	• EE mode	**Note:** ***For below adjustments use 1 : 1 probe with input capacitance less than 100 pF.*** 1) Connect a frequency counter to TP901 (midpoint of R904 and R905) and GND. Short IC901-3 to GND and short IC1-30 to VCC. 2) Adjust C905 for 7.7±0.05 MHz without video signal.
	COLOR BURST CLOCK	TP902  Fig. 2-7-2	C916 (Color burst clock)		3) Connect a frequency counter to TP902 (midpoint of R919 and R918) and GND. Adjust C916 for 14.31818±0.00015 MHz.

2.8 TUNER/IF CIRCUIT

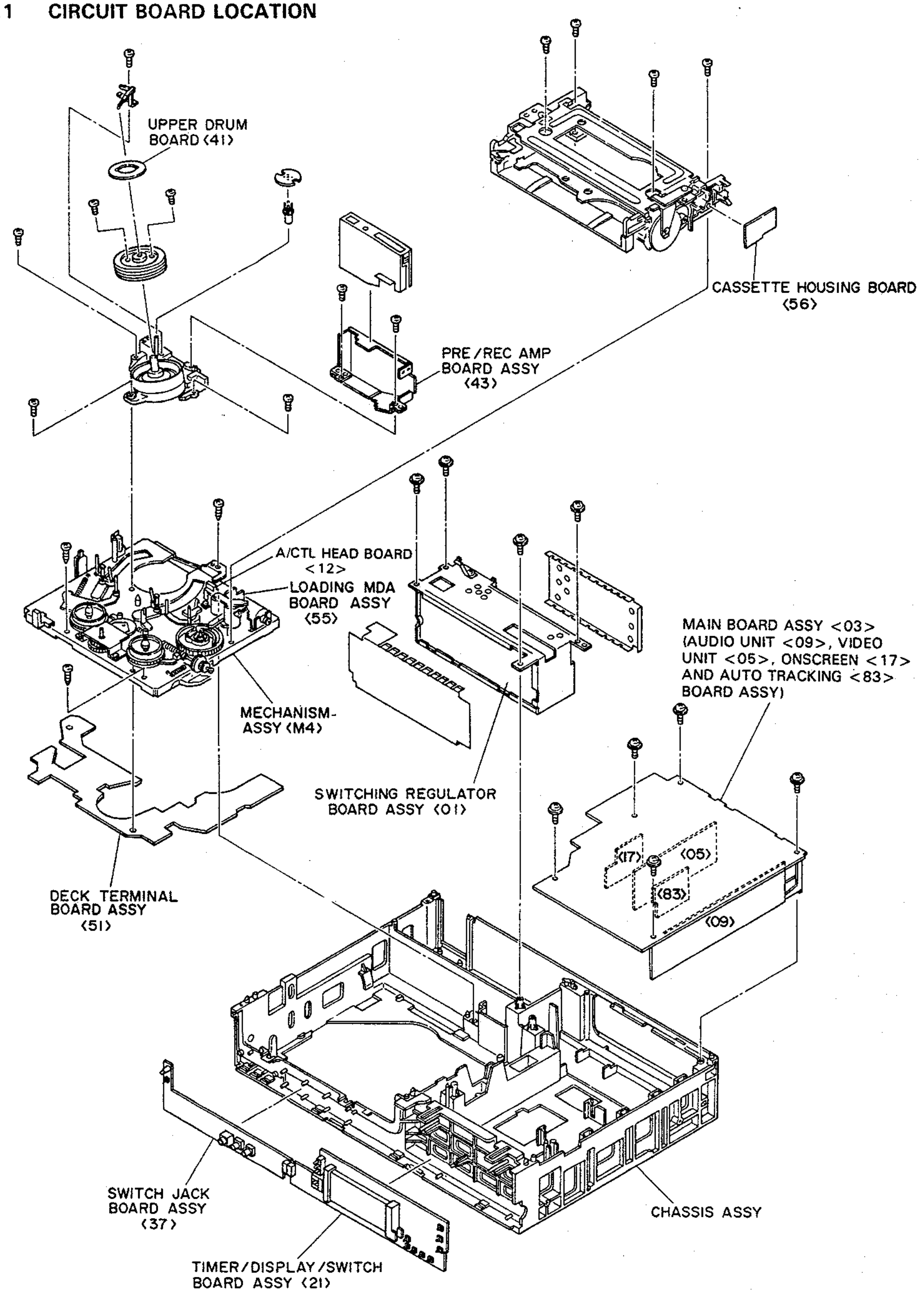
Notes: *Unless otherwise specified, all test points and adjustments are located on the MAIN board.*

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
	Equipment required: 1. Oscilloscope 2. IF sweep signal generator with suitable markers (PIF, SIF, etc.) 3. Sweeper probe (sweep signal supply cable) as shown in Fig. 2-8-1.				 C: 1000P Shorter than 8 cm Out Shield Earth R: 75 Ω Shorter than 5 cm Sweeper probe **Fig. 2-8-1**
1	VCO	IC 1-28	T2 (VCO)	• Sweep generator out: 70 dBμ (45.75 MHz) • Tuner mode without antenna IN	1) Use a sweeper probe as shown in Fig. 2-8-1 and connect the sweep generator output to pin 1 of SAW 1. Adjust the sweep gain so that the waveform does not distort as observed with the oscilloscope. Connect the oscilloscope to pin 28 of IC1 (VIDEO DET OUT) and adjust T2 to align the waveform with the frequency marker as shown in Fig. 2-8-2.
	 VCO and sweep signal (beat) **Fig. 2-8-2**			• TV broadcast • Tuner mode	**Alternate method:** 1) Receive a color broadcast on a VHF-HI channel (7 to 13). 2. Adjust T2 to obtain a fine picture on the monitor.
	• **Before the following adjustments:** 1. Connect a cable to ANT IN and terminate TV OUT at 75 Ω. 2. Set a TV channel signal generator as follows. Video : 70 dBμ/75 Ω, color bar 87.5% modulation Audio : 62 dBμ/75 Ω, 1 kHz±25 kHz deviation				
2	RF AGC	IF terminal of Front end	R21 (RF AGC)	• TV signal • Tuner mode	1) Connect the oscilloscope to IF terminal of U/V Tuner (Front end). Adjust R21 for maximum level, then again adjust R21 for −8 dB again.
		MONITOR	R21 (RF AGC)	• TV broadcast • Tuner mode	**Alternate method:** **Note:** ***Adjust R21 (RF AGC) to correct for excess noise in the picture or when streaky cross interference occurs due to strong electrical fields.*** 1) Adjust R21 to minimize noise or streaks on the TV screen. 2) Check for absence of abnormality on all channels.
3	AFC	IC1-16	T3 (AFC)	• TV signal • Tuner mode	1) With AFC MODE to NORM, connect oscilloscope to IC1-16. 2) Set the oscilloscope to DC mode and adjust T3 to set the lower edge of the ripple waveform to 4.5 V.
				• TV broadcast • Tuner mode • AFC MODE: NORM	**Alternate method:** 1) Receive a color broadcast on a VHF-HI channel (7 to 13). 2) With AFC MODE to NORM, connect oscilloscope to IC1-16. 3) Set the oscilloscope to DC mode and adjust T3 to set the lower edge of the ripple waveform to 4.5 V.

No.	Item	Check Point	Adjustment Parts	Signal & Mode	Description
4	Color Level	Q4-E	R40 (Color level)	• TV signal • Tuner mode	1) Supply a color bar signal on a VHF-HI channel (7 to 13) from a TV channel signal generator and select the channel corresponding to the generator. 2) With AFC MODE to NORM, adjust R40 to produce signal waveform as shown in Fig. 2-8-3.
	 b a Y level = 1 Magenta level = 0.45 a:b = 1:0.45 **Fig. 2-8-3**			• TV broadcast • Tuner mode	**Alternate method:** 1) Receive a color broadcast on a VHF-HI channel (7 to 13). 2) With AFC MODE to NORM, adjust R40 so that the magneta level becomes 2/3% of the sync. level.
5	SOUND DET (FM)	IC1-19	T4 (S. DET)	• TV signal • Tuner mode	1) Use a adjustment circuit as shown in Fig. 2-8-4 and with AFC SW to NORM, connect a distortion meter as shown in Fig. 2-8-4. 2) Adjust T4 for minimum distortion (less than 0.5%).
	 **Fig. 2-8-4** Adjustment circuit				
		IC1-19	T4 (S. DET)	• TV broadcast • Tuner mode	**Alternate method:** 1) Receive a color broadcast on a VHF-HI channel (7 to 13). Connect an oscilloscope to IC1-19 of the IF (MAIN) board. 2) Adjust T4 for maximum level at audio sound.

SECTION 3
CHARTS AND DIAGRAMS

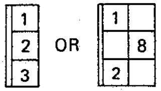
3.1 CIRCUIT BOARD LOCATION


UPPER DRUM BOARD <41>
CASSETTE HOUSING BOARD <56>
PRE/REC AMP BOARD ASSY <43>
A/CTL HEAD BOARD <12>
LOADING MDA BOARD ASSY <55>
MAIN BOARD ASSY <03> (AUDIO UNIT <09>, VIDEO UNIT <05>, ONSCREEN <17> AND AUTO TRACKING <83> BOARD ASSY)
MECHANISM-ASSY <M4>
SWITCHING REGULATOR BOARD ASSY <01>
<17>
<05>
<83>
<09>
DECK TERMINAL BOARD ASSY <51>
SWITCH JACK BOARD ASSY <37>
CHASSIS ASSY
TIMER/DISPLAY/SWITCH BOARD ASSY <21>

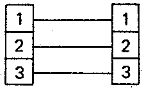
3.2 GENERAL INFORMATION

3.2.1 Connections

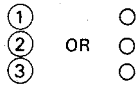
Note:
Unless otherwise specified, only signal input flow is indicated.
Connection arrows indicate only signal outputs.



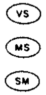
: Connectors



: Board in connectors



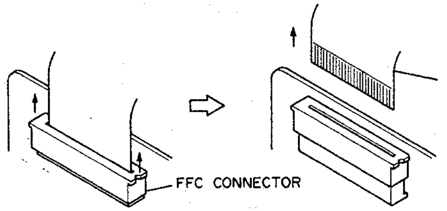
: Direct connections



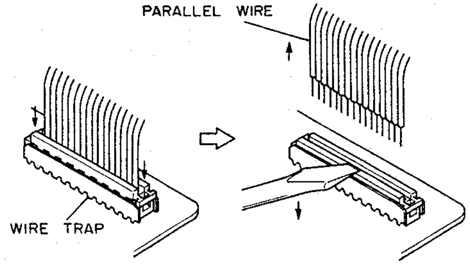
: Connected pattern in the board.
Abbreviations
V : Video M : Mechacon
S : Servo A : Audio
VS : Signal flow from video to servo.

3.2.2 Disconnecting the flatwire

1. Pull the connector structure upward to release the clamp when removing or inserting the flat wire cable.

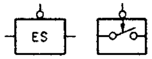


2. Depress the connector structure downward to release the clamp when removing or inserting the flat wire cable, as indicated below.

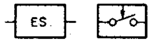


3.2.3 Indications

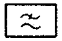
AUX : Active only at high.
$\overline{AUX}$: Active only at low.
$\bar{A}\bar{U}\bar{X}$: Active only at middle.
$\bar{A}U\bar{X}$: Active only at open.



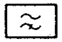
: Active only at low for electronic switch.



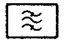
: Active only at high for electronic switch.



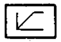
: Low pass filter.



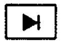
: High pass filter.



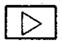
: Band pass filter.



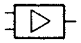
: Limiter.



: Detector



: Amplifier.

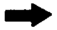


: Mixer stage.

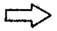
3.2.4 Schematic diagram values

Unless otherwise specified.
1. All resistance values are in ohms, 1/6 W or 1/8 W (refer to parts list).
2. All capacitance values are in μF, (P; PF).
3. All inductance values are in μH, (m; mH).
4. All diodes are 1SS133 or MA165, (refer to parts list).
5. Voltages are DC-measured (reference to ground) with a digital voltmeter during recording (SP mode) and playback (SP mode) with alignment tape. Where voltages differ between recording and playback, the voltage during playback is shown in parenthesis.
6. Waveforms (VIDEO System) are measured (reference to ground) with a color bar during recording (SP mode) and playback (SP mode) with alignment tape.
7. Waveforms (AUDIO System) are measured (reference to ground) with 1 kHz (−8 dBs) during recording and playback with alignment tape (1 kHz).
8. Shaded (▨) parts are critical for safety.
Replace only with specified part numbers.

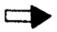
3.2.5 Signal flow in the schematic



Recording signal path



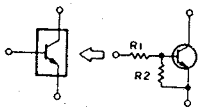
Playback signal path

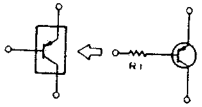


REC/PB signal path

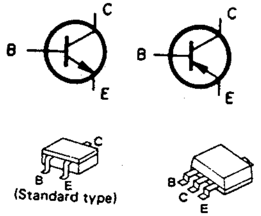
3.2.6 Semiconductors

1. Digital transistor

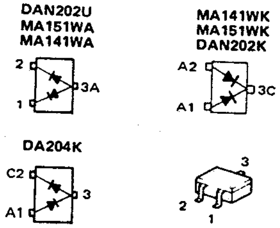




2. Chip transistor



3. Chip diode



Note:
The digital transistor includes built in resistors.
It features small size and high reliability.
Both PNP and NPN types are available.

Uses:
Inverter, Interface, driver circuits.

3.2.7 Replacement of chip parts

For replacing chip parts, proceed as follows.
Use a well insulated fine-tipped soldering iron (approx. 17 W, 130°C ~ 260°C in temp.).
In addition, it is recommended to use a soldering iron (55 W approx.) with solder absorber for convenience.

Caution:
- Do not apply heat for more than 3 seconds.
- Do not rub electrodes.
- Do not reuse chips removed once. Discard them.
- Supplementary cementing is not required.

1. Soldered condition of chip parts

- Resistors, capacitors, etc.

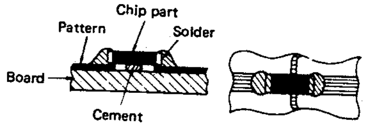


Fig. 1-1 Soldering condition-1

- Transistors, diodes, etc.

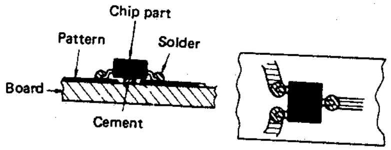


Fig. 1-2 Soldering condition-2

2. How to remove chip parts

- Resistors, capacitors, etc.

1) Place a chip parts removal tool onto the chip part to hold it down.
2) Unsolder at each side of the chip part.

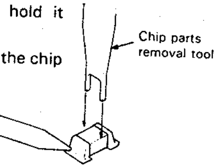


Fig. 2-1 R/C removal-1

3) Remove the chip part by twisting and sliding it.

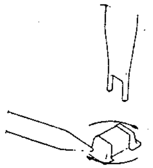


Fig. 2-2 R/C removal-2

3. How to remove transistors, diode.

1) Unsolder at the single lead side of the chip part.

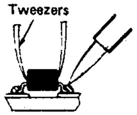


Fig. 3-1 Tr/Diode removal-1

2) Lift the unsoldered side upwards.

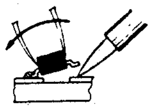


Fig. 3-2 Tr/Diode removal-2

3) Heat the other two leads simultaneously and remove the chip part upwards.

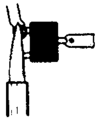


Fig. 3-3 Tr/Diode removal-3

4. Preheating and soldering

When placing new chip parts, especially capacitors, but not including transistors, preheat them with hot air (150°C approx.) by use of a blower type of hair dryer for about 2 minutes just before soldering. For soldering, use a soldering iron of 30 W approx.

5. How to place and solder chip parts

1) Presolder the contact points of the circuit pattern, to which the chip parts will be soldered.

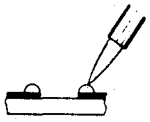


Fig. 5-1 Soldering-1

2) While holding down the chip part with the chip part removal tool, solder it with a soldering iron.

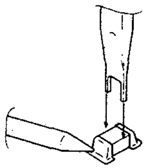


Fig. 5-2 Soldering-2

3.3 KEY TO ABBREVIATIONS

A	AC	: Alternating Current
	ACC	: Automatic Color Control
	ACCEL	: Acceleration
	A/CTL	: Audio/Control
	ADC	: Analog to Digital Converter
	ADD	: Adder
	ADRS	: Address
	ADJ	: Adjustment
	A DUB	: Audio Dubbing
	AE	: Audio Erase
	AEF	: Automatic Editing Function
	AFC	: Automatic Frequency Control
	AFT	: Automatic Fine Tuning
	AGC	: Automatic Gain Control
	AH	: Audio Head
	AL	: After Loading
	ALC	: Automatic Light Compensation Automatic Level Control
	AM	: Amplitude Modulation
	AMP	: Amplifier
	ANT	: Antenna
	APC	: Automatic Pedestal Control Automatic Phase Control
	APL	: Average Picture Level
	A/S/M	: Audio/Servo/Mechacon
	ASS'Y	: Assembly
	ATT	: Attenuator
	AUD	: Audio
	AUTO	: Automatic
	AUX	: Auxiliary

B	B	: Base
	BAL	: Balance
	BATT	: Battery
	BFP	: Burst Flag Pulse
	BIT	: Binary Digit
	BLK	: Black, Blanking
	BLU	: Blue
	BILING	: Bilingual
	BPF	: Bandpass Filter
	BRK	: Brake
	BRN	: Brown
	BT	: Band Tuning
	BUFF	: Buffer
	BW or B/W	: Black and White

C	C	: Capacitance, Collector, Color
	CAP	: Capstan, Capacitor
	CAR	: Carrier
	CARR	: Carrier
	CASS	: Cassette
	CCD	: Charge Coupled Device
	CCT	: Circuit
	CD	: Count Down
	CE	: Chip Enable
	CF	: Ceramic Filter
	CH	: Channel
	CHG	: Charge
	CHROMA	: Chrominance
	CLK	: Clock
	CLR	: Clear
	CMD	: Command
	CNT	: Count, Counter
	COL	: Color
	COM	: Common
	COMB	: Combination Comb Filter
	COMP	: Comparator Composite Compensation
	CONN	: Connector
	CONV	: Converter
	CP	: Circuit Protector Clamp Pulse
	CPC	: Capstan Phase Control
	CTL	: Control

D	D	: Drum, Digital, Diode, Drain
	DAC	: Digital to Analog Converter
	dB	: Decibel
	DC	: Direct Current
	DEC	: Decoder
	DEMOD	: Demodulator
	DEMUX	: Demultiplexer
	DET	: Detector
	DEV	: Deviation
	DIF	: Differential
	DISCR	: Discriminator
	DL	: Delay Line
	DOC	: Dropout Compensator
	DOD	: Drop Out Detector
	DPC	: Drum Phase Control

E	E	: Edit, Emitter
	EE	: Electric to Electric
	EF	: Emitter-Follower
	EMP	: Emphasis
	EN	: Enable
	ENC	: Encoder
	ENV	: Envelope
	EP	: Extended Play
	EQ	: Equalizer
	ES	: Electronic Switch
	ESNS	: End Sensor
	EXP	: Expander
	EXT	: External

F	F	: Farad, Fuse
	F ADV	: Frame Advance
	FDP	: Fluorescent Display Panel
	FE	: Full Erase
	FET	: Field Effect Transistor
	FF	: Fast Forward Flipflop
	FG	: Frequency Generator
	FM	: Frequency Modulation
	FMA	: FM Audio
	FR	: Full Recording, Frame, Fusible Resistor
	FREQ	: Frequency
	F-V CONV	: Frequency to Voltage Converter
	FWD	: Forward
	FWD S	: Forward Search

G	G	: Green, Gate, Grid
	GEN	: Generator
	GND	: Ground
	GRN	: Green
	GRY	: Gray

H	H	: High, Henry, Hour
	HG	: Hall Generator
	HPF	: Highpass Filter
	Hz	: Hertz

I	IC	: Integrated Circuit
	ID	: Identification (Pulse)
	IF	: Intermediate Frequency
	IFR	: Infrared
	IFT	: Intermediate Frequency Transformer
	IND	: Indicator
	INH	: Inhibit
	INS	: Insert
	INT	: Internal, Interrupt
	INV	: Inverter
	I/O	: Input/Output
	IR	: Infrared

L	L	: Low, Left
	LIM	: Limiter
	LIN	: Linearity
	LOAD	: Loading (Cassette)
	LP	: Long Play
	LPF	: Lowpass Filter

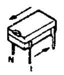
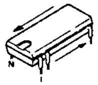
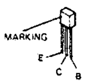
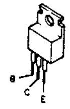
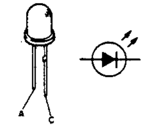
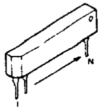
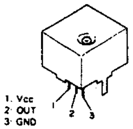
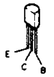
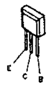
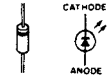
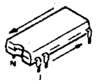
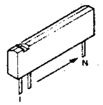
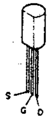
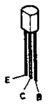
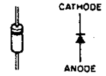
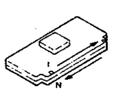
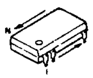
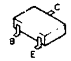
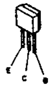
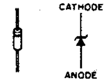
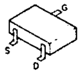
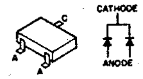
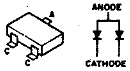
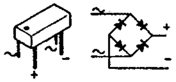
M	M	: Motor, Mega
	MAX	: Maximum
	MDA	: Motor Drive Amplifier
	MECHACON	: Mechanism Control
	MI	: Multiintroduce
	MIC	: Microphone
	MIN	: Minimum
	MIX	: Mixer, Mixing
	MMV	: Monostable Multivibrator
	MOD	: Modulation, Modulator
	MODEM	: Modulator-Demodulator
	MON	: Monitor
	MPX	: Multiplexer, Multiplex
	MS	: Mode Select
N	NAND	: Not-And
	NC	: Not Connected, Normally Closed
	NFB	: Negative Feedback
	NLN	: Non-Linear
	NO	: Normally Open
	NOR	: Normal, Not-Or
	NR	: Noise Reduction
O	OP	: Operation
	OPAMP	: Operational Amplifier
	ORN	: Orange
	OSC	: Oscillator
P	PB	: Playback
	PC	: Photocoupler, Pulse Counter
	PCM	: Pulse Code Modulation
	PG	: Pulse Generator
	PGM	: Program
	PI	: Photo Interrupter
	PIF	: Picture Intermediate Frequency
	PLA	: Programmable Logic Array
	PLL	: Phase Locked Loop
	POS	: Position
	p-p	: Peak-to-Peak
	PREAMP	: Preamplifier
	P/S	: Pause/Still
	PSC	: Pulse Swallowing Control
	PU	: Pickup
	PUT	: Programmable Unijunction Transistor
	PWM	: Pulse Width Modulation
	PWR	: Power
Q	Q	: Quality Factor
R	R	: Red, Right
	RA	: Resistor Array
	RAE	: Random Access Enable
	RAM	: Random Access Memory
	REC	: Recording
	REF	: Reference
	REG	: Regulated, Regulator
	REM	: Remote
	REMOCON	: Remote Control (Unit)
	REV	: Reverse
	REV S	: Reverse Search
	REW	: Rewind
	R/P	: Record/Playback
	RPT	: Repeat
	RST	: Reset
	RT	: Rotary Transformer
	RUN	: Running
	RY	: Relay
S	SAW	: Sawtooth, Surface Acoustic Wave
	SC	: Subcarrier, Simulcast
	SCH	: Search
	SEL	: Select, Selector
	SENS	: Sensor
	SEP	: Separator
	SF	: Source Follower
	SFF	: Short Fast Forward
	SIF	: Sound Intermediate Frequency
	SHARP	: Sharpness
	SN	: Signal to Noise Ratio
	SOL	: Solenoid
	SP	: Standard Play
	SREV	: Search Reverse
	SREW	: Short Rewind
	S/S	: Slow/Still
	SSG	: Sync Signal Generator
	SSNS	: Start Sensor
	STD	: Strobe Data, Standard
	SUP	: Supply
	SW	: Switch
	SWD	: Switched
	SYNC	: Synchronization
T	TF	: Thermal Fuse
	TIM	: Timing
	TK	: Tracking
	TNR	: Tuner
	TP	: Test Point
	TPZD	: Trapezoid
	TR	: Transistor, Trimmer
	TRANS	: Transformer
	TU	: Take-up
U	UL	: Unloading
	UNREG	: Unregulated
	UNSW	: Unswitched
V	V	: Vertical, Volt
	VCO	: Voltage Controlled Oscillator
	VD	: Vertical Drive
	VIF	: Video Intermediate Frequency
	VLT	: Violet
	VR	: Variable Resistor
	VS	: Video and Sync
	V/T	: Video/Television
	V/U	: VHF/UHF
	VXO	: Variable Crystal Oscillator
W	W	: Watt
	W & D	: White and Dark
	WHT	: White
X	XTAL	: Crystal
Y	Y	: Luminance
	YEL	: Yellow

3.4 MAIN TYPES OF ACTIVE AND PACKAGE CIRCUIT

INTEGRATED CIRCUIT		
	NAME	L
A	AN33080NK AN3386NK-A	2A 3A
B	BA6418N BA7039	3B 1B
C	CAT93C46P CXA1011P	7B 3A
G	GP1U541X	2B
H	HA118125NT HD49733NT HD404729RY03S	1B 4B 2B
M	MSM6866RS M37418M6-244SP M50554-168SP M51365SP M52684AP	4B 3A 3A 3A 1A
P	PB20166A-01 PB20167B-01	4A 4A
S	SN74HCU04N	1B
U	UPC1870CA	1B

TRANSISTOR		
	NAME	L
DTA	DTA113ZU DTA114EU DTA123EU DTA124EU DTA144WU	4C 4C 4C 4C 4C
DTB	DTB114ES	2D
DTC	DTC114ES DTC114EU DTC124ES DTC124EU DTC124TU DTC143TU DTC144EU DTC144WU	2D 4C 1C 4C 4C 4C 4C 4C
P	PN268VI-NC	4D
2SA	2SA1020 2SA1532 2SA1576 2SA1577 2SA720 2SA933S	3C 4C 4C 4C 2C 5C
2SB	2SB1425 2SB941P	3D 1D
2SC	2SC1317 2SC1740 2SC1740S 2SC3311A 2SC3354 2SC3616 2SC4081 2SC4097 2SC4098 2SC4130	3D 2C 4D 1C 1C 3D 4C 4C 4C 1D
2SD	2SD1328S,T 2SD1450S,T 2SD1468S	4C 1C 5C
2SK	2SK665	5C

DIODE		
	NAME	L
A	AG01 AU01 AU01Z	3E 3E 3E
D	DAN202U DAP202U DF04M	5E 6E 7E
E	E-452-2	3E
H	HZS7.5EB2 HZ30-2L	4E 4E
L	LTZ-MR15	2E
M	MA141WK MA165 MTZV6.2A MTZ108	5E 3E 4E 4E
R	RD15ES-T1B RD15ES-T1B3 RD30ES-T1B1 RD6.8ES-T1B1 RD8.2ES-T1B1 RD9.1ES-T1B2 RK14LF-B2 RL4Z-LFK2	4E 4E 4E 4E 4E 4E 3E 3E
S	SLH-34MC3F SLH-34VC3F	1E 1E
U	UZ5.1BSC UZ9.1BSB	4E 4E
111	1SS132 1SS133 1SS292 11EFS2 11ES2	3E 3E 3E 3E 3E

	Integrated Circuit		Transistor		Diode
	A	B	C	D	E
1			 MARKING E C B		
2		 1. Vcc 2. OUT 3. GND 1 2 3			 CATHODE ANODE
3					 CATHODE ANODE
4					 CATHODE ANODE
5					 C A A CATHODE ANODE
6					 A C C ANODE CATHODE
7					
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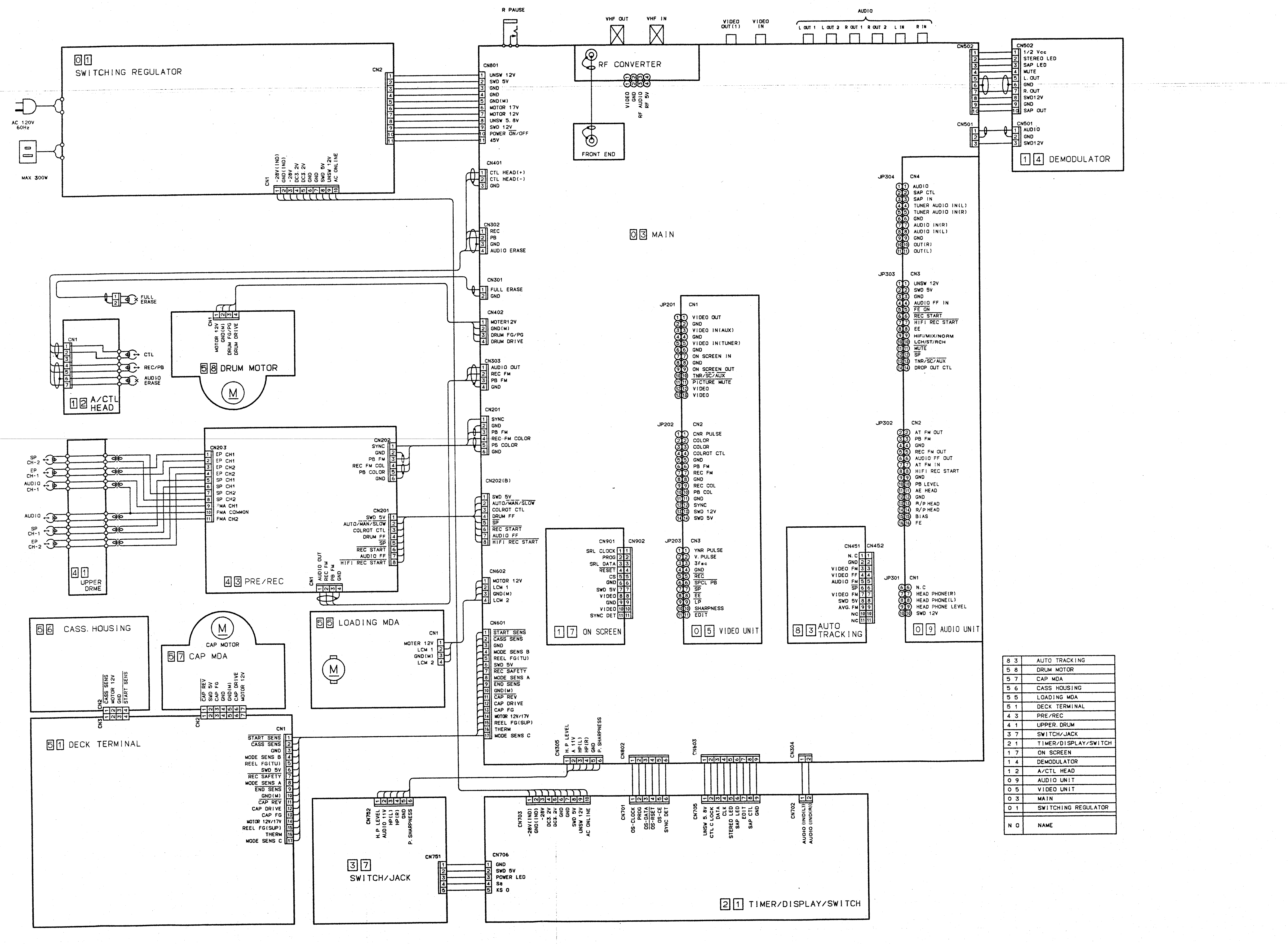
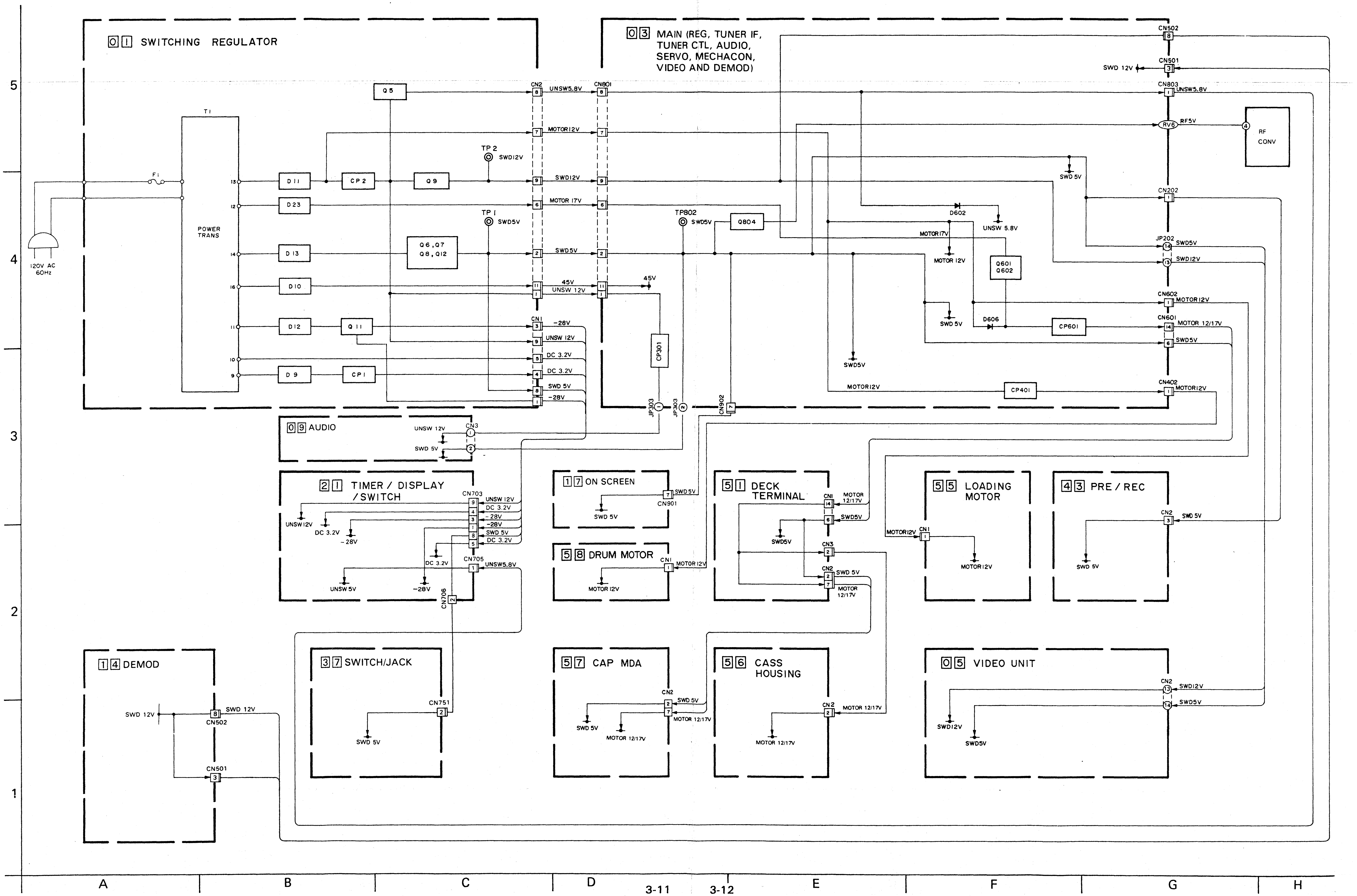
3.5 BOARD INTERCONNECTION



0 1 SWITCHING REGULATOR
AC 120V 60Hz
MAX 300W
CN2
CN1
-28V(IND)
GND(IND)
-28V
DC3.2V
DC3.2V
GND
GND
SWD 5V
UNSW 12V
AC ONLINE
R PAUSE
VHF OUT
VHF IN
VIDEO OUT(1)
VIDEO IN
AUDIO
L OUT 1
L OUT 2
R OUT 1
R OUT 2
L IN
R IN
RF CONVERTER
VIDEO
GND
RF AUDIO
RF 5V
FRONT END
CN801
UNSW 12V
SWD 5V
GND
GND
GND(M)
MOTOR 17V
MOTOR 12V
UNSW 5.8V
SWD 12V
POWER ON/OFF
45V
CN401
CTL HEAD(+)
CTL HEAD(-)
GND
CN302
REC
PB
GND
AUDIO ERASE
CN301
FULL ERASE
GND
CN402
MOTER12V
GND(M)
DRUM FG/PG
DRUM DRIVE
CN303
AUDIO OUT
REC FM
PB FM
GND
CN201
SYNC
GND
PB FM
REC FM COLOR
PB COLOR
GND
CN202(B)
SWD 5V
AUTO/MAN/SLOW
COLROT CTL
DRUM FF
SP
REC START
AUDIO FF
HIFI REC START
CN602
MOTOR 12V
LCM 1
GND(M)
LCM 2
CN601
START SENS
CASS SENS
GND
MODE SENS B
REEL FG(TU)
SWD 5V
REC SAFETY
MODE SENS A
END SENS
GND(M)
CAP REV
CAP DRIVE
CAP FG
MOTOR 12V/17V
REEL FG(SUP)
THERM
MODE SENS C
0 3 MAIN
CN502
1/2 Vcc
STEREO LED
SAP LED
MUTE
L. OUT
GND
R. OUT
SWD12V
GND
SAP OUT
CN501
AUDIO
GND
SWD12V
1 4 DEMODULATOR
JP304
CN4
AUDIO
SAP CTL
SAP IN
TUNER AUDIO IN(L)
TUNER AUDIO IN(R)
GND
AUDIO IN(R)
AUDIO IN(L)
GND
OUT(R)
OUT(L)
JP303
CN3
UNSW 12V
SWD 5V
GND
AUDIO FF IN
FE ON
REC START
HIFI REC START
EE
HIFI/MIX/NORM
LCH/ST/RCH
MUTE
SP
TNR/SC/AUX
DROP OUT CTL
JP302
CN2
AT FM OUT
PB FM
GND
REC FM OUT
AUDIO FF OUT
AT FM IN
HIFI REC START
GND
PB LEVEL
AE HEAD
GND
R/P HEAD
R/P HEAD
BIAS
FE
JP301
CN1
N.C
HEAD PHONE(R)
HEAD PHONE(L)
HEAD PHONE LEVEL
SWD 12V
0 9 AUDIO UNIT
JP201
CN1
VIDEO OUT
GND
VIDEO IN(AUX)
GND
VIDEO IN(TUNER)
GND
ON SCREEN IN
GND
ON SCREEN OUT
TNR/SC/AUX
PICTURE MUTE
VIDEO
VIDEO
JP202
CN2
CNR PULSE
COLOR
COLOR
COLROT CTL
GND
PB FM
REC FM
GND
REC COL
PB COL
GND
SYNC
SWD 12V
SWD 5V
JP203
CN3
YNR PULSE
V. PULSE
3fsc
GND
REC
SPCL PB
EE
LP
SHARPNESS
EDIT
0 5 VIDEO UNIT
CN901
CN902
SRL CLOCK
PROG
SRL DATA
RESET
CS
GND
SWD 5V
VIDEO
GND
VIDEO
SYNC DET
1 7 ON SCREEN
CN451
CN452
N.C
GND
VIDEO FM
VIDEO FF
AUDIO FM
SP
VIDEO FM
SWD 5V
AVG. FM
NC
NC
8 3 AUTO TRACKING
FULL ERASE
CN1
CTL
REC/PB
AUDIO ERASE
1 2 A/CTL HEAD
CN1
MOTOR 12V
GND(M)
DRUM FG/PG
DRUM DRIVE
5 8 DRUM MOTOR
M
SP CH-2
EP CH-1
AUDIO CH-1
AUDIO
SP CH-1
EP CH-2
4 1 UPPER DRME
CN203
EP CH1
EP CH1
EP CH2
EP CH2
SP CH1
SP CH1
SP CH2
SP CH2
FMA CH1
FMA COMMON
FMA CH2
CN202
SYNC
GND
PB FM
REC FM COL
PB COLOR
GND
CN201
SWD 5V
AUTO/MAN/SLOW
COLROT CTL
DRUM FF
SP
REC START
AUDIO FF
HIFI REC START
CN1
AUDIO OUT
REC FM
PB FM
GND
4 3 PRE/REC
5 6 CASS. HOUSING
CN2
CASS SENS
MOTOR 12V
GND
START SENS
CN3
M
CAP MOTOR
5 7 CAP MDA
CAP REV
SWD 5V
CAP FG
GND(M)
CAP DRIVE
MOTOR 12V
CN2
5 5 LOADING MDA
CN1
MOTER 12V
LCM 1
GND(M)
LCM 2
M
5 1 DECK TERMINAL
CN1
START SENS
CASS SENS
GND
MODE SENS B
REEL FG(TU)
SWD 5V
REC SAFETY
MODE SENS A
END SENS
GND(M)
CAP REV
CAP DRIVE
CAP FG
MOTOR 12V/17V
REEL FG(SUP)
THERM
MODE SENS C
CN305
H.P LEVEL
A 11V
HP(L)
HP(R)
GND
P. SHARPNESS
CN802
CN603
CN304
CN752
H.P LEVEL
AUDIO 11V
HP(L)
HP(R)
GND
P. SHARPNESS
CN751
3 7 SWITCH/JACK
CN703
-28V(IND)
GND(IND)
-28V
DC3.2V
DC3.2V
GND
GND
SWD 5V
UNSW 12V
AC ONLINE
CN701
OS-CLOCK
PROG
OS-DATA
OS-RSET
OS-CE
SYNC DET
CN705
UNSW 5.8V
CTL C LOCK
DATA
CLK
STEREO LED
SAP LED
EDIT
SAP CTL
GND
CN702
AUDIO (IND(L))
AUDIO (IND(R))
CN706
GND
SWD 5V
POWER LED
Sa
KS 0
2 1 TIMER/DISPLAY/SWITCH
1
2
3
4
5
A
B
C
D
E
F
G
H

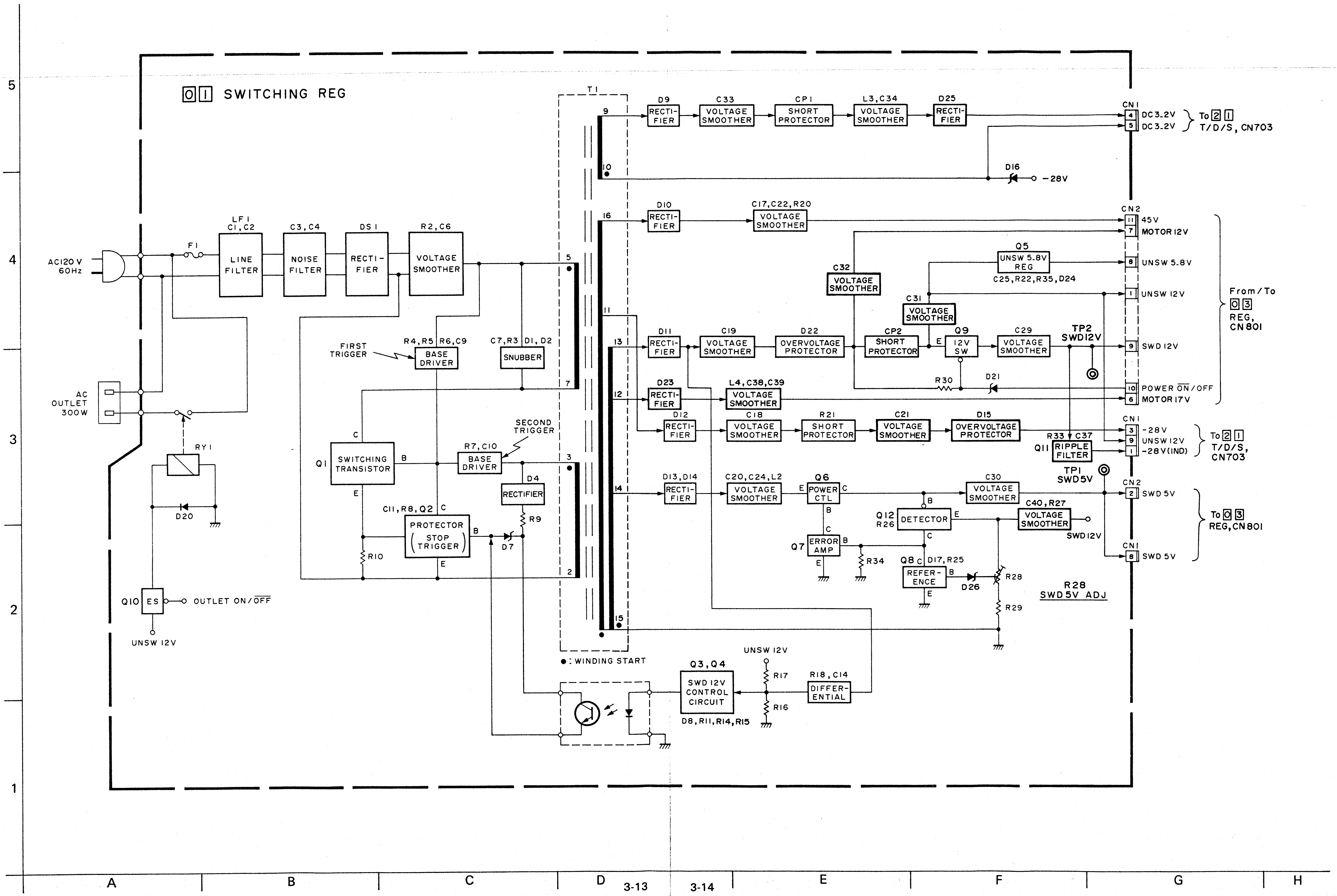
8 3	AUTO TRACKING
5 8	DRUM MOTOR
5 7	CAP MDA
5 6	CASS HOUSING
5 5	LOADING MDA
5 1	DECK TERMINAL
4 3	PRE/REC
4 1	UPPER. DRUM
3 7	SWITCH/JACK
2 1	TIMER/DISPLAY/SWITCH
1 7	ON SCREEN
1 4	DEMODULATOR
1 2	A/CTL HEAD
0 9	AUDIO UNIT
0 5	VIDEO UNIT
0 3	MAIN
0 1	SWITCHING REGULATOR
N O	NAME

3.6 POWER SYSTEM BLOCK DIAGRAM



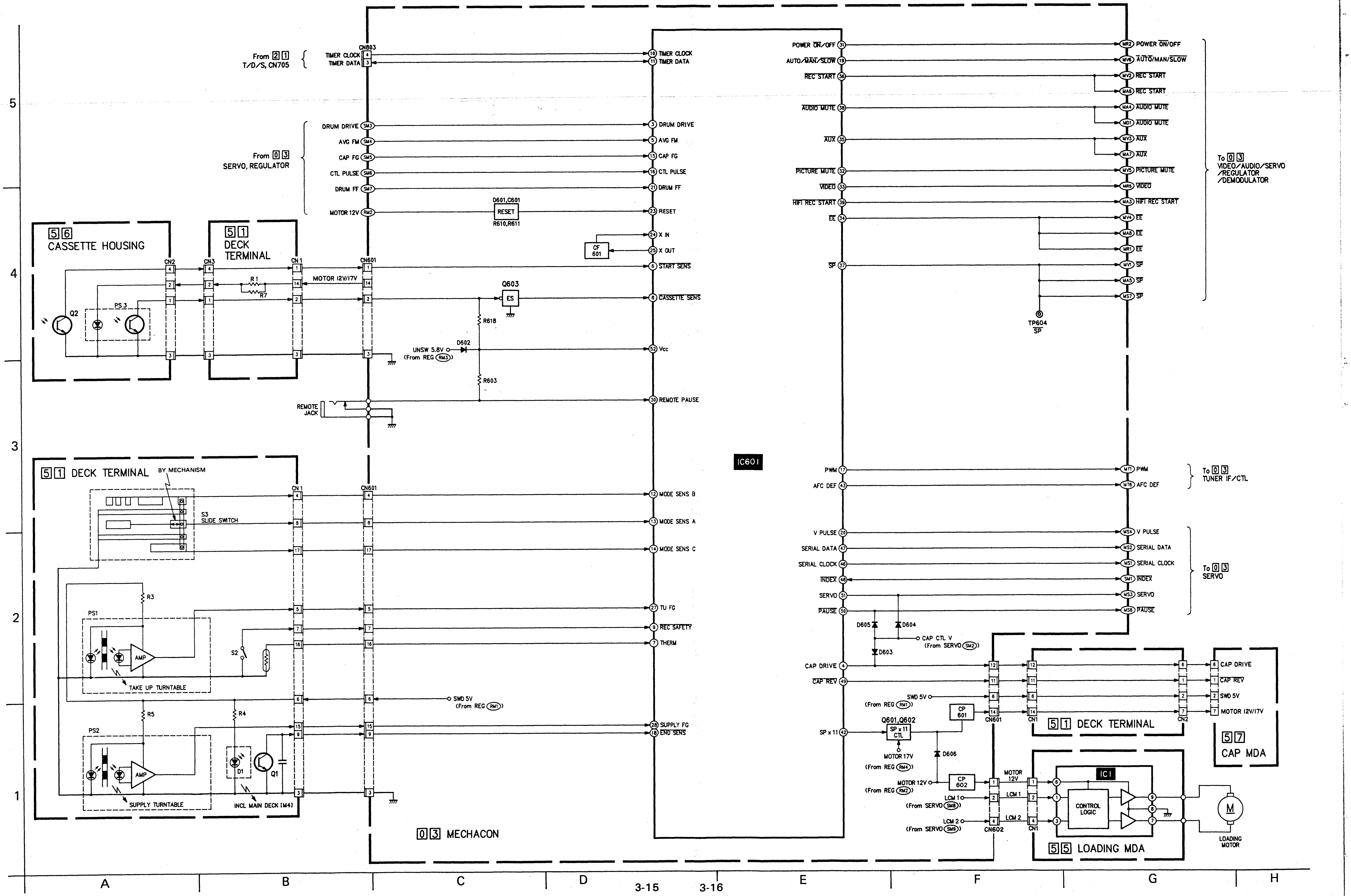
01 SWITCHING REGULATOR
03 MAIN (REG, TUNER IF, TUNER CTL, AUDIO, SERVO, MECHACON, VIDEO AND DEMOD)
120V AC 60Hz
F1
T1
POWER TRANS
Q5
D11
CP2
Q9
D23
D13
Q6,Q7 Q8,Q12
D10
D12
Q11
D9
CP1
TP2 SWD12V
TP1 SWD5V
CN2
CN801
UNSW5.8V
MOTOR12V
SWD12V
MOTOR 17V
SWD5V
45V
UNSW 12V
CN1
-28V
UNSW 12V
DC 3.2V
DC 3.2V
SWD 5V
-28V
TP802 SWD5V
Q804
CP301
JP303
CN902
CN502
CN501
SWD 12V
CN803
UNSW5.8V
RV6
RF5V
RF CONV
SWD 5V
CN202
D602
UNSW 5.8V
MOTOR17V
MOTOR 12V
JP202
SWD5V
SWD12V
Q601 Q602
CN602
MOTOR12V
CN601
MOTOR 12/17V
SWD5V
D606
CP601
SWD5V
CN402
MOTOR12V
CP401
09 AUDIO
UNSW 12V
SWD 5V
CN3
21 TIMER / DISPLAY /SWITCH
CN703
UNSW 12V
DC 3.2V
-28V
-28V
SWD 5V
DC 3.2V
UNSW12V
DC 3.2V
-28V
DC 3.2V
CN705
UNSW5.8V
UNSW 5V
-28V
CN706
17 ON SCREEN
SWD5V
CN901
SWD 5V
58 DRUM MOTOR
CN1
MOTOR12V
MOTOR 12V
51 DECK TERMINAL
CN1
MOTOR 12/17V
SWD5V
SWD5V
CN3
CN2
SWD 5V
MOTOR 12/17V
55 LOADING MOTOR
MOTOR12V
CN1
MOTOR12V
43 PRE / REC
CN2
SWD 5V
SWD 5V
14 DEMOD
SWD 12V
CN502
SWD 12V
CN501
37 SWITCH/JACK
CN751
SWD 5V
57 CAP MDA
CN2
SWD 5V
MOTOR 12/17V
SWD 5V
MOTOR 12/17V
56 CASS HOUSING
CN2
MOTOR 12/17V
MOTOR 12/17V
05 VIDEO UNIT
CN2
SWD12V
SWD5V
SWD12V
SWD5V
5
4
3
2
1
A
B
C
D
E
F
G
H

3.7 SWITCHING REGULATOR BLOCK DIAGRAM



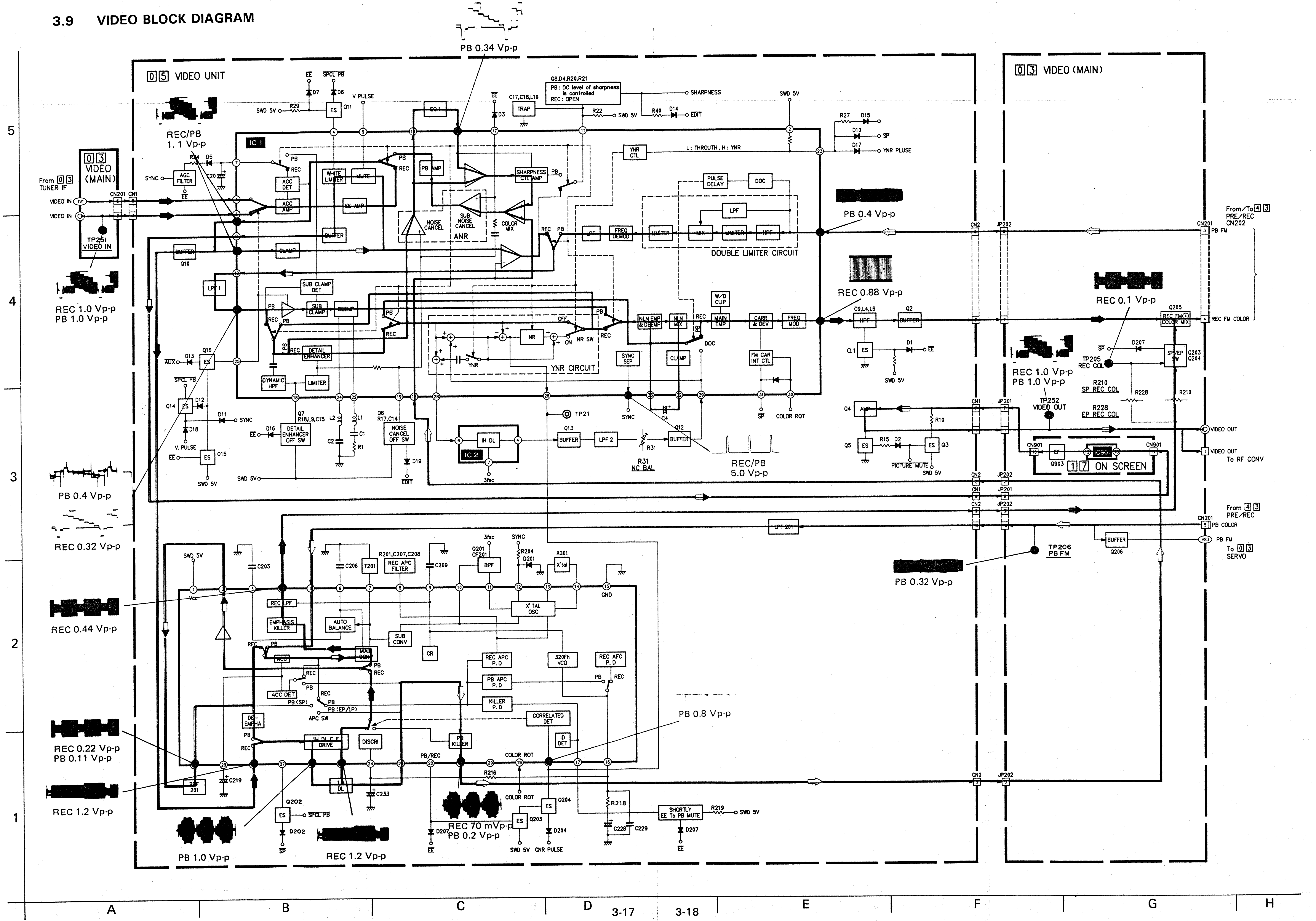
01 SWITCHING REG
AC120 V 60Hz
F1
LF1 C1, C2
LINE FILTER
C3, C4
NOISE FILTER
DS1
RECTI-FIER
R2, C6
VOLTAGE SMOOTHER
AC OUTLET 300W
RY1
D20
Q10
ES
OUTLET ON/OFF
UNSW 12V
FIRST TRIGGER
R4, R5 R6, C9
BASE DRIVER
C7, R3 D1, D2
SNUBBER
Q1
SWITCHING TRANSISTOR
C
B
E
SECOND TRIGGER
R7, C10
BASE DRIVER
D4
RECTIFIER
R9
C11, R8, Q2
PROTECTOR (STOP TRIGGER)
D7
R10
T1
9
10
16
5
11
13
7
12
3
14
2
15
●: WINDING START
D9
RECTI-FIER
C33
VOLTAGE SMOOTHER
CP1
SHORT PROTECTOR
L3, C34
VOLTAGE SMOOTHER
D25
RECTI-FIER
D16
-28V
CN1
4 DC3.2V
5 DC3.2V
To 21 T/D/S, CN703
D10
RECTI-FIER
C17, C22, R20
VOLTAGE SMOOTHER
CN2
11 45V
7 MOTOR 12V
Q5
UNSW 5.8V REG
C25, R22, R35, D24
8 UNSW 5.8V
C32
VOLTAGE SMOOTHER
1 UNSW 12V
C31
VOLTAGE SMOOTHER
From/To 03 REG, CN801
D11
RECTI-FIER
C19
VOLTAGE SMOOTHER
D22
OVERVOLTAGE PROTECTOR
CP2
SHORT PROTECTOR
Q9
12V SW
C29
VOLTAGE SMOOTHER
TP2 SWD12V
9 SWD 12V
R30
D21
10 POWER ON/OFF
D23
RECTI-FIER
L4, C38, C39
VOLTAGE SMOOTHER
6 MOTOR 17V
D12
RECTI-FIER
C18
VOLTAGE SMOOTHER
R21
SHORT PROTECTOR
C21
VOLTAGE SMOOTHER
D15
OVERVOLTAGE PROTECTOR
CN1
3 -28V
9 UNSW 12V
1 -28V(IND)
To 21 T/D/S, CN703
R33 C37
Q11
RIPPLE FILTER
TP1 SWD5V
D13, D14
RECTI-FIER
C20, C24, L2
VOLTAGE SMOOTHER
Q6
POWER CTL
C30
VOLTAGE SMOOTHER
CN2
2 SWD 5V
Q12 R26
DETECTOR
C40, R27
VOLTAGE SMOOTHER
SWD12V
To 03 REG, CN801
CN1
8 SWD 5V
Q7
ERROR AMP
R34
Q8
D17, R25
REFER-ENCE
D26
R28
R29
R28 SWD5V ADJ
UNSW 12V
R17
R16
Q3, Q4
SWD 12V CONTROL CIRCUIT
D8, R11, R14, R15
R18, C14
DIFFER-ENTIAL
1
2
3
4
5
A
B
C
D
E
F
G
H

3.8 SYSTEM CONTROL BLOCK DIAGRAM



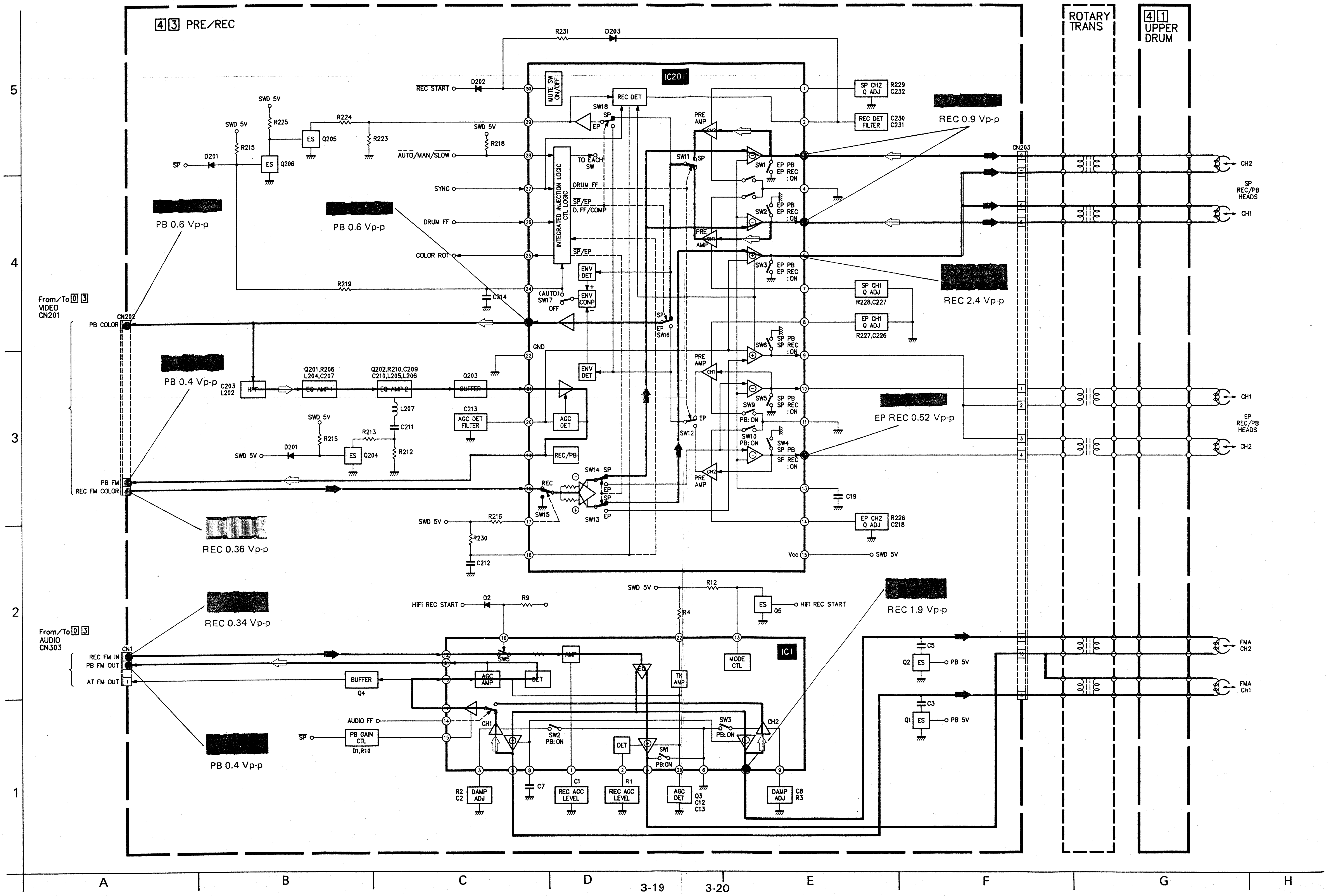
From 2 1
T/D/S, CN705
CN803
TIMER CLOCK
TIMER DATA
From 0 3
SERVO, REGULATOR
DRUM DRIVE
AVG FM
CAP FG
CTL PULSE
DRUM FF
MOTOR 12V
D601,C601
RESET
R610,R611
CF 601
5 6
CASSETTE HOUSING
5 1
DECK TERMINAL
CN2
CN3
CN1
CN601
MOTOR 12V/17V
R1
R7
PS3
Q2
Q603
ES
R618
D602
UNSW 5.8V
(From REG RM3)
R603
REMOTE JACK
TIMER CLOCK
TIMER DATA
DRUM DRIVE
AVG FM
CAP FG
CTL PULSE
DRUM FF
RESET
X IN
X OUT
START SENS
CASSETTE SENS
Vcc
REMOTE PAUSE
IC601
5 1 DECK TERMINAL
BY MECHANISM
S3
SLIDE SWITCH
R3
PS1
AMP
TAKE UP TURNTABLE
S2
R5
R4
PS2
SUPPLY TURNTABLE
D1
Q1
INCL MAIN DECK [M4]
SWD 5V
(From REG RM1)
MODE SENS B
MODE SENS A
MODE SENS C
TU FG
REC SAFETY
THERM
SUPPLY FG
END SENS
0 3 MECHACON
POWER ON/OFF
AUTO/MAN/SLOW
REC START
AUDIO MUTE
AUX
PICTURE MUTE
VIDEO
HIFI REC START
EE
SP
TP604
SP
To 0 3
VIDEO/AUDIO/SERVO
/REGULATOR
/DEMODULATOR
PWM
AFC DEF
To 0 3
TUNER IF/CTL
V PULSE
SERIAL DATA
SERIAL CLOCK
INDEX
SERVO
PAUSE
To 0 3
SERVO
D605
D604
CAP CTL V
(From SERVO SM2)
D603
CAP DRIVE
CAP REV
SWD 5V
(From REG RM1)
CP 601
Q601,Q602
SP x 11 CTL
SP x 11
MOTOR 17V
(From REG RM4)
D606
MOTOR 12V
(From REG RM2)
CP 602
LCM 1
(From SERVO SM8)
LCM 2
(From SERVO SM9)
CN601
CN602
CN1
CN2
5 1 DECK TERMINAL
CAP DRIVE
CAP REV
SWD 5V
MOTOR 12V/17V
5 7
CAP MDA
MOTOR 12V
LCM 1
LCM 2
IC1
CONTROL LOGIC
5 5 LOADING MDA
M
LOADING MOTOR
A
B
C
D
E
F
G
H
1
2
3
4
5

3.9 VIDEO BLOCK DIAGRAM



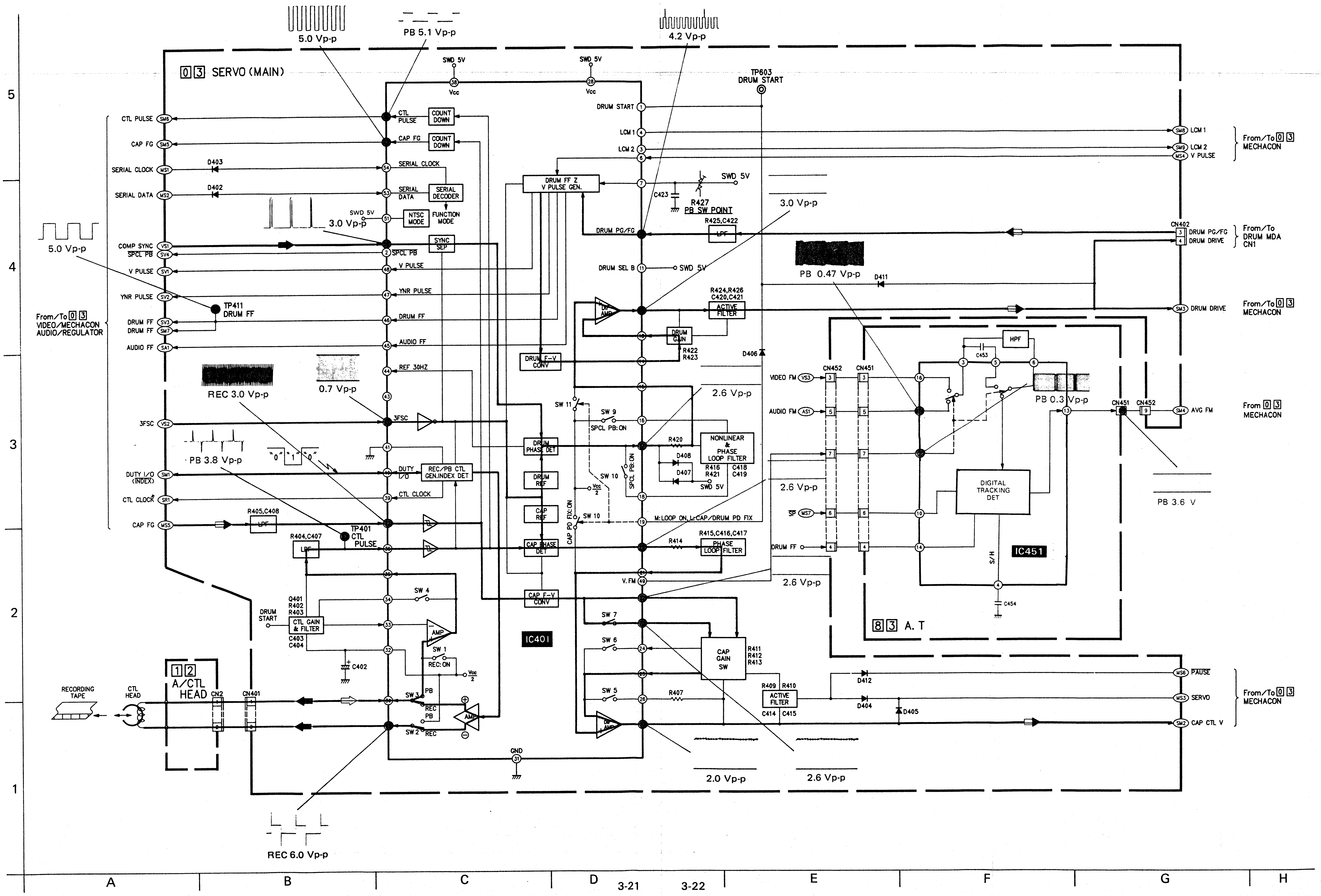
05 VIDEO UNIT
03 VIDEO (MAIN)
03 VIDEO (MAIN)
From 03 TUNER IF
VIDEO IN
VIDEO IN
TP251 VIDEO IN
CN201
CN1
REC/PB 1.1 Vp-p
PB 0.34 Vp-p
REC 1.0 Vp-p
PB 1.0 Vp-p
PB 0.4 Vp-p
REC 0.32 Vp-p
REC 0.44 Vp-p
REC 0.22 Vp-p
PB 0.11 Vp-p
REC 1.2 Vp-p
PB 1.0 Vp-p
REC 1.2 Vp-p
REC 70 mVp-p
PB 0.2 Vp-p
PB 0.8 Vp-p
PB 0.4 Vp-p
REC 0.88 Vp-p
REC/PB 5.0 Vp-p
REC 0.1 Vp-p
REC 1.0 Vp-p
PB 1.0 Vp-p
PB 0.32 Vp-p
IC 1
IC 2
AGC FILTER
AGC DET
AGC AMP
WHITE LIMITER
MUTE
EE AMP
PB AMP
SHARPNESS CTL AMP
NOISE CANCEL
SUB NOISE CANCEL
ANR
COLOR MIX
BUFFER
CLAMP
LPF 1
SUB CLAMP DET
SUB CLAMP
DEEMP
DETAIL ENHANCER
DYNAMIC HPF
LIMITER
NR
YNR CIRCUIT
NLN EMP & DEEMP
NLN MIX
MAIN EMP
W/D CLIP
CARR & DEV
FREQ MOD
FM CAR INT CTL
SYNC SEP
CLAMP
DOC
PULSE DELAY
DOC
LPF
LPF
FREQ DEMOD
LIMITER
MIX
LIMITER
HPF
DOUBLE LIMITER CIRCUIT
YNR CTL
L: THROUTH, H: YNR
Q8,D4,R20,R21
PB: DC level of sharpness is controlled
REC: OPEN
SHARPNESS
EDIT
SWD 5V
TRAP
C17,C18,L10
EQ 1
V PULSE
ES
Q11
D6
D7
SPCL PB
EE
R29
R22
R40
D14
D3
R27
D15
D10
SP
D17
YNR PLUSE
R24
D5
C20
SYNC
Q10
AUX
D13
Q16
Q14
D12
D18
D11
V. PULSE
Q15
SWD 5V
Q7
R18,L9,C15
DETAIL ENHANCER OFF SW
D16
L2
L1
C2
C1
R1
Q6
R17,C14
NOISE CANCEL OFF SW
D19
EDIT
IH DL
3fsc
TP21
Q13
BUFFER
LPF 2
R31
NC BAL
Q12
BUFFER
C4
SYNC
SP
COLOR ROT
OFF
ON
NR SW
REC
PB
C9,L4,L6
HPF
Q2
BUFFER
Q1
ES
D1
EE
SWD 5V
Q4
AMP
R10
Q5
ES
R15
D2
Q3
PICTURE MUTE
SWD 5V
CN2
JP202
CN1
JP201
CN201
From/To 43 PRE/REC CN202
PB FM
REC FM COLOR
Q205
REC FM COLOR MIX
SF
D207
SP/EP SW
Q203 Q204
TP205 REC COL
R210 SP REC COL
R228
R210
R228 EP REC COL
TP252 VIDEO OUT
VIDEO OUT
VIDEO OUT To RF CONV
CN901
CF
Q903
IC901
17 ON SCREEN
From 43 PRE/REC
PB COLOR
PB FM
To 03 SERVO
LPF 201
BUFFER
Q206
VS3
TP206 PB FM
SWD 5V
Vcc
C203
C206
T201
R201,C207,C208
REC APC FILTER
C209
3fsc
Q201 CF201
BPF
SYNC
R204
D201
X201
X'tal
GND
REC LPF
EMPHASIS KILLER
AUTO BALANCE
SUB CONV
X'TAL OSC
CR
ACC
MAIN CONV
ACC DET
PB (SP)
PB (EP/LP)
APC SW
REC APC P.D
PB APC P.D
KILLER P.D
320Fh VCO
REC AFC P.D
CORRELATED DET
ID DET
DE-EMPHA
1H DL C.F DRIVE
DISCRI
PB KILLER
BPF 201
C219
1H DL
C233
PB/REC
COLOR ROT
R216
COLOR ROT
Q202
ES
SPCL PB
D202
SP
D207
EE
Q203
ES
Q204
D204
SWD 5V
CNR PULSE
R218
C228
C229
SHORTLY EE To PB MUTE
R219
SWD 5V
D207
EE
A
B
C
D
E
F
G
H
1
2
3
4
5

3.10 PRE/REC BLOCK DIAGRAM



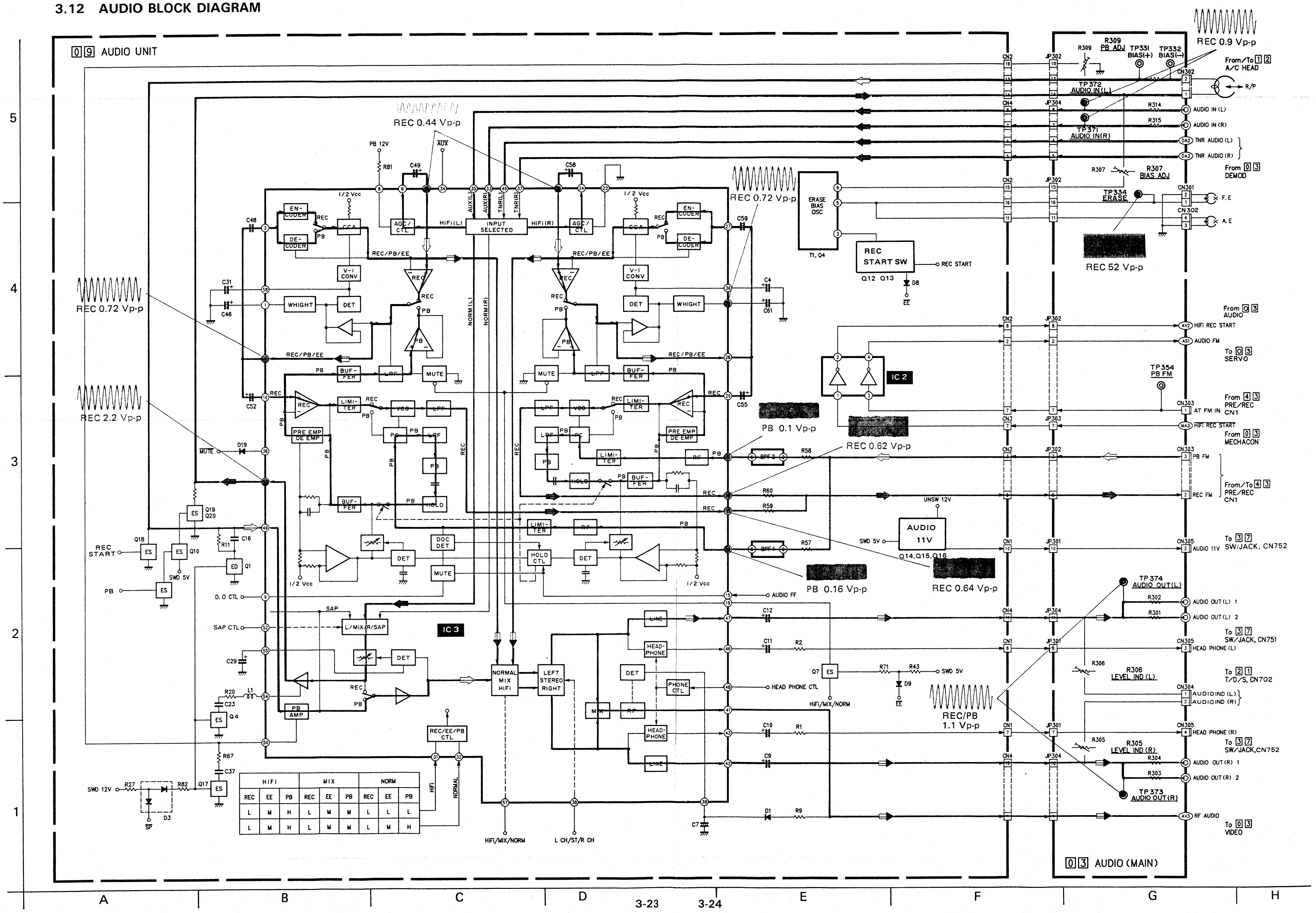
4 3 PRE/REC
IC201
IC1
ROTARY TRANS
4 1 UPPER DRUM
From/To 0 3 VIDEO CN201
From/To 0 3 AUDIO CN303
CN202
CN203
CN1
PB COLOR
PB FM
REC FM COLOR
REC FM IN
PB FM OUT
AT FM OUT
PB 0.6 Vp-p
PB 0.6 Vp-p
PB 0.4 Vp-p
REC 0.36 Vp-p
REC 0.34 Vp-p
PB 0.4 Vp-p
REC 0.9 Vp-p
REC 2.4 Vp-p
EP REC 0.52 Vp-p
REC 1.9 Vp-p
R231
D203
D202
REC START
MUTE SW ON/OFF
REC DET
SW18
SP
EP
SWD 5V
R225
R224
R223
ES
Q205
Q206
R215
D201
R218
AUTO/MAN/SLOW
SYNC
DRUM FF
COLOR ROT
INTEGRATED INJECTION LOGIC CTL LOGIC
TO EACH SW
DRUM FF
SP/EP
D. FF/COMP
SP/EP
R219
C214
(AUTO)
SW17
OFF
ENV DET
ENV CONP
SW16
GND
HPF
C203 L202
Q201,R206 L204,C207
EQ AMP 1
Q202,R210,C209 C210,L205,L206
EQ AMP 2
Q203
BUFFER
L207
C213
AGC DET FILTER
AGC DET
C211
R213
R212
Q204
D201
REC/PB
REC
SW14
SW15
SW13
R216
R230
C212
SW11
SW12
PRE AMP
CH1
CH2
SW1
SW2
SW3
SW4
SW5
SW6
SW9
SW10
EP PB
EP REC : ON
SP PB
SP REC : ON
PB: ON
SP CH2 Q ADJ
R229 C232
REC DET FILTER
C230 C231
SP CH1 Q ADJ
R228,C227
EP CH1 Q ADJ
R227,C226
C19
EP CH2 Q ADJ
R226 C218
Vcc
SWD 5V
SP REC/PB HEADS
EP REC/PB HEADS
FMA CH2
FMA CH1
R12
R4
ES
Q5
HIFI REC START
D2
R9
SW5
AMP
AGC AMP
DET
EQ
TK AMP
MODE CTL
BUFFER
Q4
AUDIO FF
PB GAIN CTL
D1,R10
SW2 PB: ON
SW3 PB: ON
SW1 PB: ON
DET
C7
C1
R1
R2 C2
DAMP ADJ
REC AGC LEVEL
AGC DET
Q3 C12 C13
DAMP ADJ
C8 R3
C5
C3
Q2
Q1
PB 5V
A
B
C
D
E
F
G
H
1
2
3
4
5

3.11 SERVO BLOCK DIAGRAM



0 3 SERVO (MAIN)
5.0 Vp-p
PB 5.1 Vp-p
4.2 Vp-p
SWD 5V
Vcc
TP603
DRUM START
DRUM START
LCM 1
LCM 2
CTL PULSE
CAP FG
SERIAL CLOCK
SERIAL DATA
COMP SYNC
SPCL PB
V PULSE
YNR PULSE
DRUM FF
DRUM FF
AUDIO FF
3FSC
DUTY I/O (INDEX)
CTL CLOCK
CAP FG
From/To 0 3 VIDEO/MECHACON AUDIO/REGULATOR
5.0 Vp-p
TP411 DRUM FF
D403
D402
COUNT DOWN
COUNT DOWN
SERIAL DECODER
NTSC MODE
FUNCTION MODE
SYNC SEP
3.0 Vp-p
REF 30HZ
REC 3.0 Vp-p
0.7 Vp-p
PB 3.8 Vp-p
"0" "1" "0"
REC/PB CTL GEN.INDEX DET
R405,C408
LPF
TP401 CTL PULSE
R404,C407
LPF
Q401 R402 R403
CTL GAIN & FILTER
C403 C404
DRUM START
C402
SW 4
AMP
SW 1
REC:ON
Vcc/2
SW 3 PB REC
SW 2 REC PB
AMP
1 2 A/CTL HEAD
CN2
CN401
RECORDING TAPE
CTL HEAD
REC 6.0 Vp-p
GND
DRUM FF Z V PULSE GEN.
C423
R427 PB SW POINT
R425,C422
LPF
DRUM PG/FG
DRUM SEL B
SWD 5V
DIF AMP
R424,R426 C420,C421
ACTIVE FILTER
DRUM GAIN
R422 R423
DRUM F-V CONV
SW 11
SW 9
SPCL PB:ON
DRUM PHASE DET
DRUM REF
CAP REF
CAP PHASE DET
CAP F-V CONV
SW 10
CAP PD FIX:ON
SPCL PB:ON
R420
D408
D407
NONLINEAR & PHASE LOOP FILTER
R416 R421 C418 C419
SWD 5V
M:LOOP ON, L:CAP/DRUM PD FIX
R414
R415,C416,C417
PHASE LOOP FILTER
V.FM
SW 7
SW 6
SW 5
R407
CAP GAIN SW
R411 R412 R413
R409 R410
ACTIVE FILTER
C414 C415
DIF AMP
IC401
3.0 Vp-p
2.6 Vp-p
2.6 Vp-p
2.6 Vp-p
2.0 Vp-p
2.6 Vp-p
PB 0.47 Vp-p
D411
D406
D412
D404
D405
VIDEO FM
AUDIO FM
SP
DRUM FF
CN452
CN451
HPF
C453
PB 0.3 Vp-p
DIGITAL TRACKING DET
S/H
C454
IC451
8 3 A. T
CN451 CN452
PB 3.6 V
CN402
DRUM PG/FG
DRUM DRIVE
From/To DRUM MDA CN1
LCM 1
LCM 2
V PULSE
From/To 0 3 MECHACON
DRUM DRIVE
From/To 0 3 MECHACON
AVG FM
From 0 3 MECHACON
PAUSE
SERVO
CAP CTL V
From/To 0 3 MECHACON
5
4
3
2
1
A
B
C
D
E
F
G
H

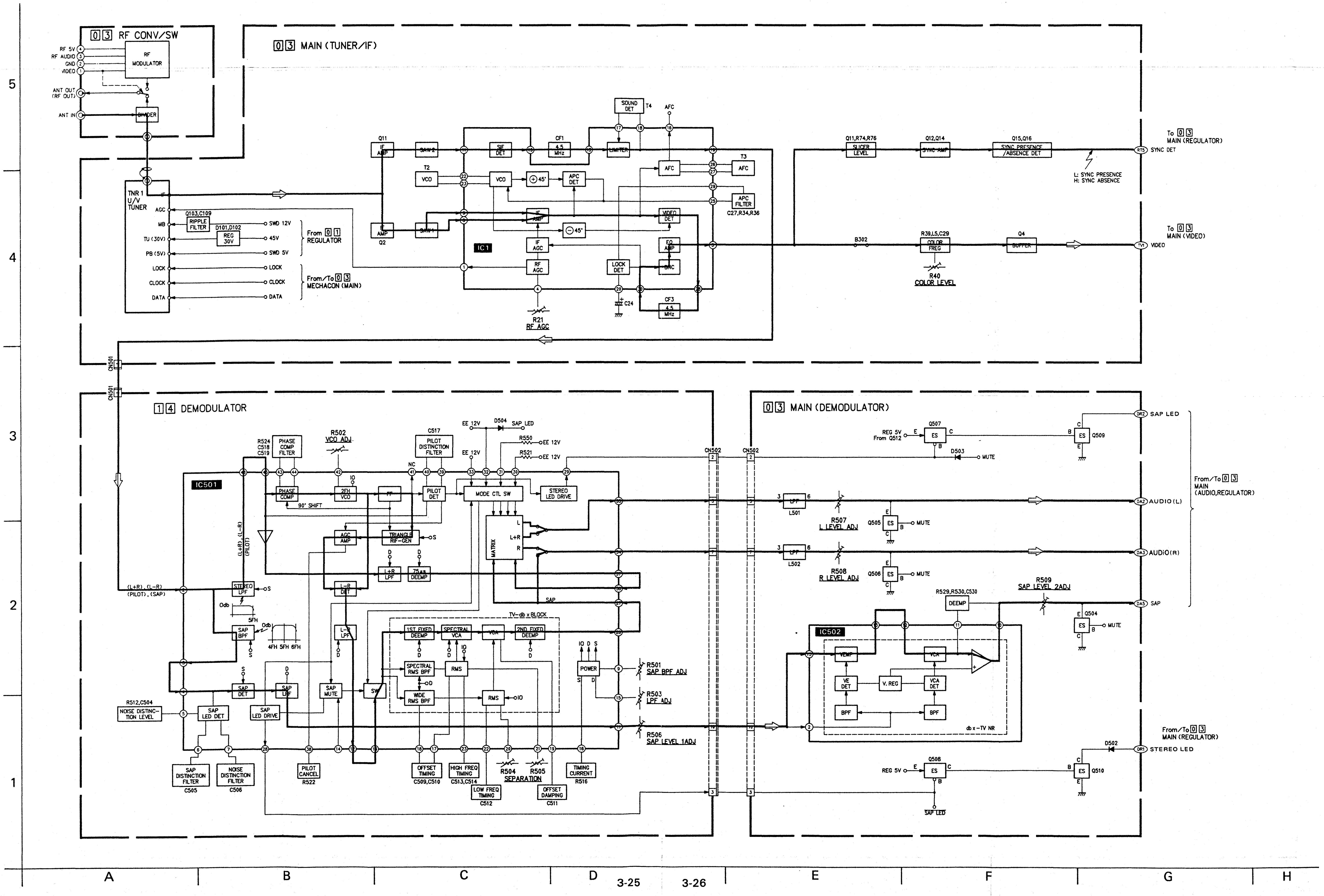
3.12 AUDIO BLOCK DIAGRAM



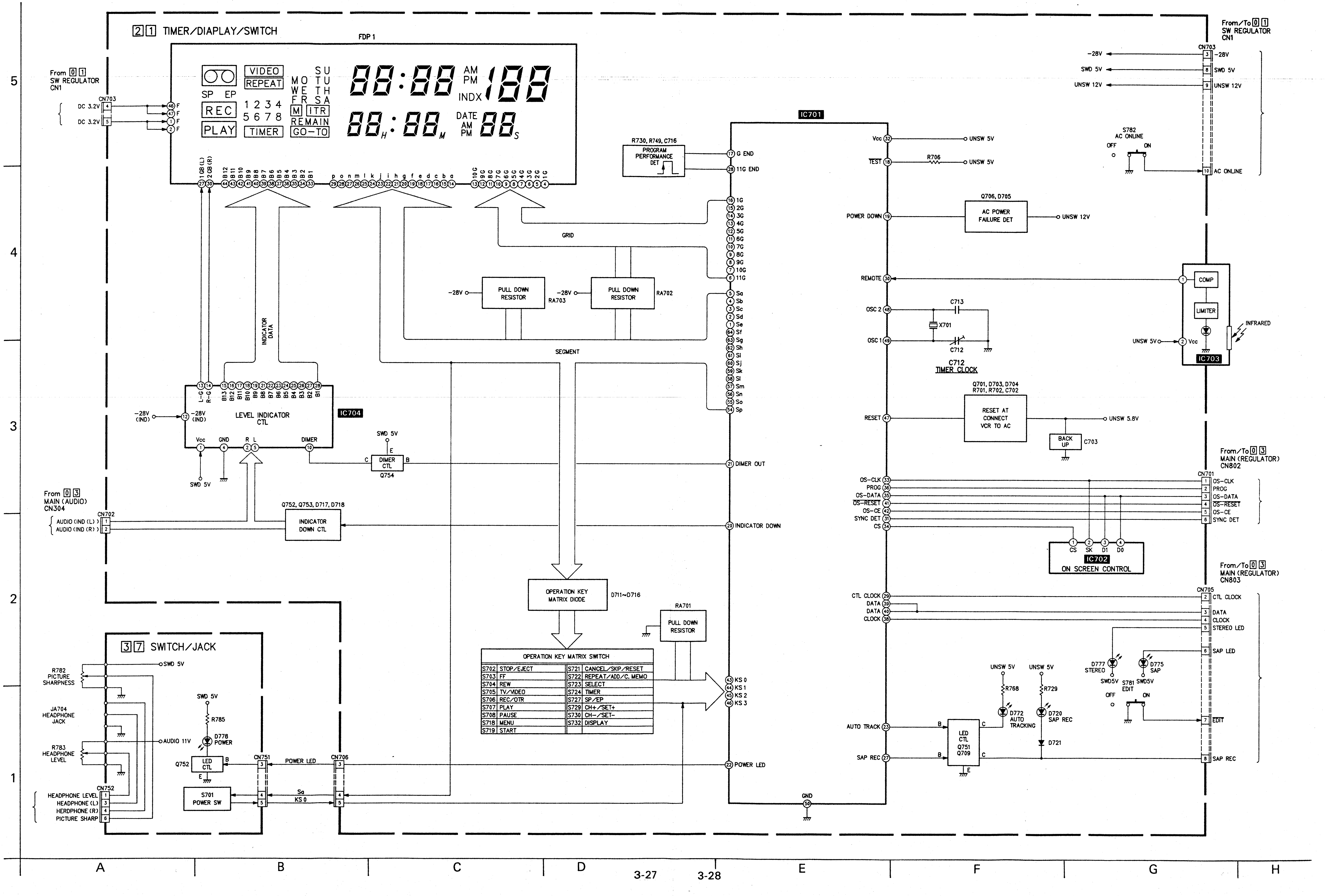
09 AUDIO UNIT
03 AUDIO (MAIN)
IC3
IC2
REC 0.44 Vp-p
REC 0.72 Vp-p
REC 2.2 Vp-p
REC 0.9 Vp-p
REC 52 Vp-p
PB 0.1 Vp-p
REC 0.62 Vp-p
PB 0.16 Vp-p
REC 0.64 Vp-p
REC/PB 1.1 Vp-p
EN-CODER
DE-CODER
CCA
AGC/CTL
INPUT SELECTED
HiFi(L)
HiFi(R)
AUX(L)
AUX(R)
TNR(L)
TNR(R)
NORM(L)
NORM(R)
V-I CONV
WHIGHT
DET
REC/PB/EE
BUF-FER
LPF
MUTE
LIMI-TER
VCO
PC
PB
HOLD
PRE EMP DE EMP
RF
BPF 1
BPF 2
DOC DET
HOLD CTL
L/MIX/R/SAP
SAP
PB AMP
NORMAL MIX HiFi
LEFT STEREO RIGHT
LINE
HEAD-PHONE
PHONE CTL
MIX
REC/EE/PB CTL
HiFi/MIX/NORM
L CH/ST/R CH
ERASE BIAS OSC
T1, Q4
REC START SW
Q12 Q13
REC START
AUDIO 11V
Q14,Q15,Q16
UNSW 12V
SWD 5V
SWD 12V
PB 12V
1/2 Vcc
MUTE
REC START
PB
D. O CTL
SAP CTL
AUDIO FF
HEAD PHONE CTL
HiFi/MIX/NORM
ES
ED
Q1
Q4
Q7
Q10
Q17
Q18
Q19 Q20
D1
D3
D8
D9
D19
SF
EE
R309 PB ADJ
TP331 BIAS(+)
TP332 BIAS(−)
TP372 AUDIO IN(L)
TP371 AUDIO IN(R)
R307 BIAS ADJ
TP334 ERASE
TP354 PB FM
TP374 AUDIO OUT(L)
TP373 AUDIO OUT(R)
R306 LEVEL IND (L)
R305 LEVEL IND (R)
CN1
CN2
CN3
CN4
JP301
JP302
JP303
JP304
CN301
CN302
CN303
CN304
CN305
From/To 12 A/C HEAD
R/P
AUDIO IN (L)
AUDIO IN (R)
TNR AUDIO (L)
TNR AUDIO (R)
From 03 DEMOD
F. E
A. E
From 03 AUDIO
HiFi REC START
AUDIO FM
To 03 SERVO
From 43 PRE/REC CN1
AT FM IN
HiFi REC START
From 03 MECHACON
PB FM
REC FM
From/To 43 PRE/REC CN1
AUDIO 11V
To 37 SW/JACK, CN752
AUDIO OUT (L) 1
AUDIO OUT (L) 2
To 37 SW/JACK, CN751
HEAD PHONE (L)
To 21 T/D/S, CN702
AUDIO IND (L)
AUDIO IND (R)
HEAD PHONE (R)
To 37 SW/JACK,CN752
AUDIO OUT (R) 1
AUDIO OUT (R) 2
RF AUDIO
To 03 VIDEO
A
B
C
D
E
F
G
H
1
2
3
4
5

HiFi			MIX			NORM			
REC	EE	PB	REC	EE	PB	REC	EE	PB	
L	M	H	L	M	M	L	L	L	HiFi
L	M	H	L	M	M	L	M	H	NORMAL

3.13 TUNER IF AND DEMODULATOR BLOCK DIAGRAMS

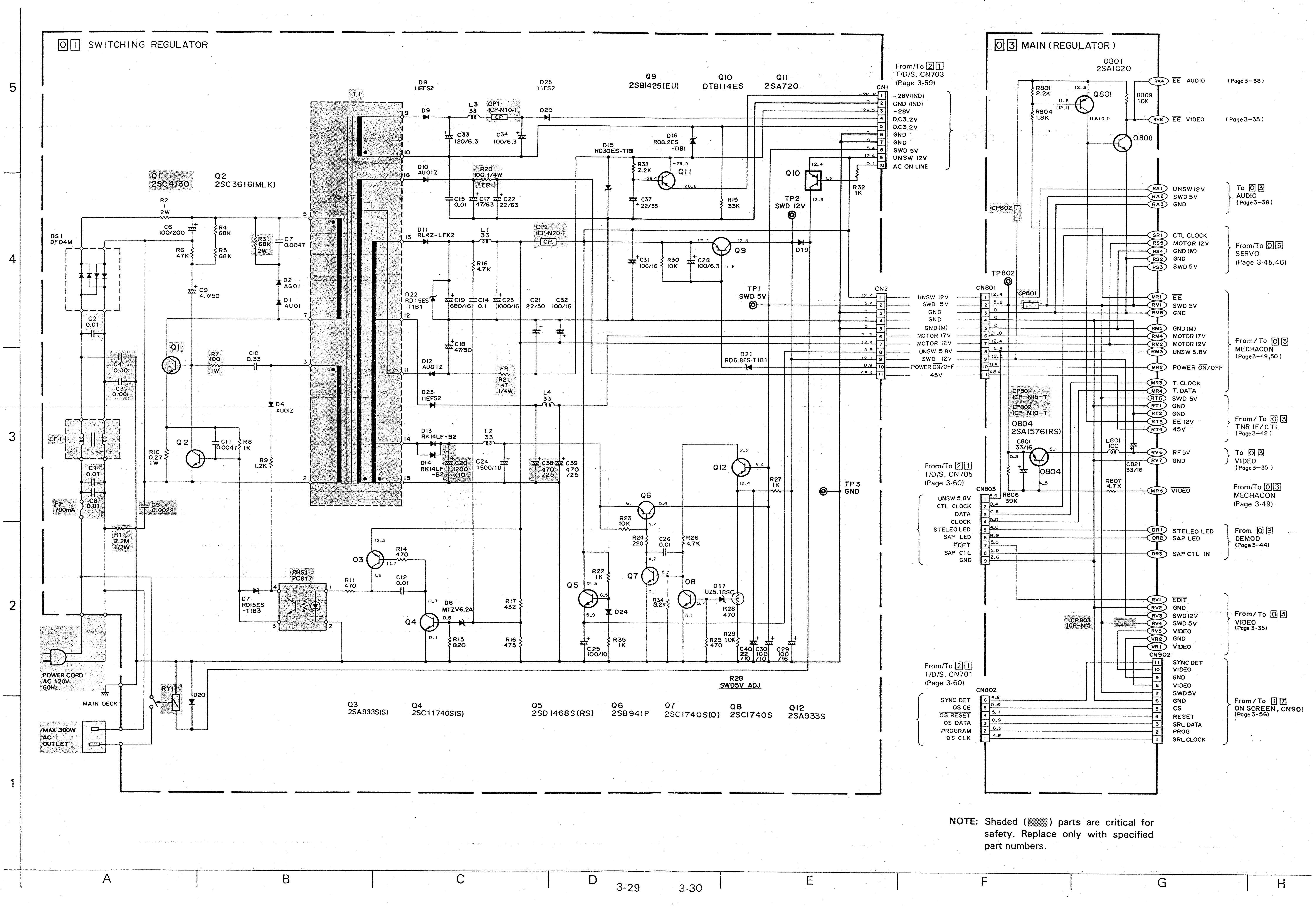

03 RF CONV/SW
RF 5V
RF AUDIO
GND
VIDEO
RF MODULATOR
ANT OUT (RF OUT)
ANT IN
DIVIDER
03 MAIN (TUNER/IF)
TNR1 U/V TUNER
IF
AGC
MB
TU (30V)
PB (5V)
LOCK
CLOCK
DATA
Q103,C109 RIPPLE FILTER
D101,D102 REG 30V
SWD 12V
45V
SWD 5V
From 01 REGULATOR
From/To 03 MECHACON (MAIN)
Q11 IF AMP
Q2 IF AMP
SAW2
SAW1
T2 VCO
VCO
+45°
−45°
APC DET
SIF DET
CF1 4.5 MHz
SOUND DET
T4
AFC
LIMITER
T3 AFC
APC FILTER
C27,R34,R36
IF AMP
VIDEO DET
IF AGC
RF AGC
EQ AMP
LOCK DET
SNC
CF3 4.5 MHz
C24
IC1
R21 RF AGC
Q11,R74,R76 SLICER LEVEL
Q12,Q14 SYNC AMP
Q15,Q16 SYNC PRESENCE /ABSENCE DET
L: SYNC PRESENCE
H: SYNC ABSENCE
To 03 MAIN (REGULATOR)
SYNC DET
B302
R39,L5,C29 COLOR FREQ
R40 COLOR LEVEL
Q4 BUFFER
To 03 MAIN (VIDEO)
VIDEO
CN501
14 DEMODULATOR
IC501
R524 C518 C519
PHASE COMP FILTER
R502 VCO ADJ
C517 PILOT DISTINCTION FILTER
EE 12V
D504 SAP LED
R550
R521
NC
PHASE COMP
90° SHIFT
2FH VCO
FF
PILOT DET
MODE CTL SW
STEREO LED DRIVE
AGC AMP
TRIANGLE RIF-GEN
L+R LPF
75µs DEEMP
MATRIX
L
L+R
R
L−R DET
(L+R), (L−R) (PILOT), (SAP)
STEREO LPF
(L+R), (L−R) (PILOT)
0db
5FH
SAP BPF
4FH 5FH 6FH
L−R LPF
TV−db x BLOCK
1ST FIXED DEEMP
SPECTRAL VCA
VCA
2ND FIXED DEEMP
SPECTRAL RMS BPF
RMS
WIDE RMS BPF
SAP DET
SAP LPF
SAP MUTE
SW
SAP
POWER
R501 SAP BPF ADJ
R503 LPF ADJ
R506 SAP LEVEL 1ADJ
R512,C504 NOISE DISTINCTION LEVEL
SAP LED DET
SAP LED DRIVE
SAP DISTINCTION FILTER C505
NOISE DISTINCTION FILTER C506
PILOT CANCEL R522
OFFSET TIMING C509,C510
HIGH FREQ TIMING C513,C514
LOW FREQ TIMING C512
R504 R505 SEPARATION
OFFSET DAMPING C511
TIMING CURRENT R516
CN502
03 MAIN (DEMODULATOR)
REG 5V From Q512
Q507 ES
D503
MUTE
Q509 ES
SAP LED
From/To 03 MAIN (AUDIO,REGULATOR)
LPF L501
R507 L LEVEL ADJ
Q505 ES
AUDIO (L)
LPF L502
R508 R LEVEL ADJ
Q506 ES
AUDIO (R)
R529,R530,C530 DEEMP
R509 SAP LEVEL 2ADJ
Q504 ES
IC502
VEMP
VCA
VE DET
V. REG
VCA DET
BPF
db x−TV NR
From/To 03 MAIN (REGULATOR)
D502
STEREO LED
REG 5V
Q508 ES
Q510 ES
A
B
C
D
E
F
G
H
1
2
3
4
5

3.14 TIMER/DISPLAY/SWITCH AND SWITCH/JACK BLOCK DIAGRAMS



2 1 TIMER/DIAPLAY/SWITCH
FDP 1
VIDEO
REPEAT
SP EP
REC
PLAY
TIMER
MO TU WE TH FR SA SU
M ITR
REMAIN
GO-TO
88:88 AM PM INDX 188
88H:88M DATE AM PM 88S
From 0 1 SW REGULATOR CN1
CN703
DC 3.2V
DC 3.2V
1 G8 (L)
2 G8 (R)
B13 B12 B11 B10 B9 B8 B7 B6 B5 B4 B3 B2 B1
p o n m l k j i h g f e d c b a
10G 9G 8G 7G 6G 5G 4G 3G 2G 1G
INDICATOR DATA
GRID
SEGMENT
-28V
PULL DOWN RESISTOR
RA703
RA702
L-G R-G
LEVEL INDICATOR CTL
IC704
-28V (IND)
Vcc GND R L DIMER
SWD 5V
DIMER CTL
Q754
C E B
From 0 3 MAIN (AUDIO) CN304
CN702
AUDIO (IND (L))
AUDIO (IND (R))
Q752, Q753, D717, D718
INDICATOR DOWN CTL
OPERATION KEY MATRIX DIODE
D711~D716
RA701
OPERATION KEY MATRIX SWITCH
S702 STOP/EJECT
S703 FF
S704 REW
S705 TV/VIDEO
S706 REC/OTR
S707 PLAY
S708 PAUSE
S718 MENU
S719 START
S721 CANCEL/SKIP/RESET
S722 REPEAT/ADD/C. MEMO
S723 SELECT
S724 TIMER
S727 SP/EP
S729 CH+/SET+
S730 CH-/SET-
S732 DISPLAY
R730, R749, C716
PROGRAM PERFORMANCE DET
IC701
G END
11G END
1G 2G 3G 4G 5G 6G 7G 8G 9G 10G 11G
Sa Sb Sc Sd Se Sf Sg Sh Si Sj Sk Sl Sm Sn So Sp
DIMER OUT
INDICATOR DOWN
KS 0
KS 1
KS 2
KS 3
POWER LED
GND
Vcc
UNSW 5V
TEST
R706
POWER DOWN
Q706, D705
AC POWER FAILURE DET
UNSW 12V
REMOTE
OSC 2
OSC 1
C713
X701
C712
C712 TIMER CLOCK
Q701, D703, D704 R701, R702, C702
RESET
RESET AT CONNECT VCR TO AC
BACK UP
C703
UNSW 5.8V
OS-CLK PROG OS-DATA OS-RESET OS-CE SYNC DET CS
CS SK D1 D0
IC702
ON SCREEN CONTROL
CTL CLOCK DATA DATA CLOCK
AUTO TRACK
SAP REC
UNSW 5V
R768
R729
D772 AUTO TRACKING
D720 SAP REC
D721
LED CTL Q751 Q709
B C E
From/To 0 1 SW REGULATOR CN1
CN703
-28V
SWD 5V
UNSW 12V
S782 AC ONLINE
OFF ON
AC ONLINE
COMP
LIMITER
INFRARED
UNSW 5V
Vcc
IC703
From/To 0 3 MAIN (REGULATOR) CN802
CN701
OS-CLK PROG OS-DATA OS-RESET OS-CE SYNC DET
From/To 0 3 MAIN (REGULATOR) CN803
CN705
CTL CLOCK DATA CLOCK STEREO LED SAP LED EDIT SAP REC
D777 STEREO
D775 SAP
SWD5V
S781 EDIT
3 7 SWITCH/JACK
R782 PICTURE SHARPNESS
JA704 HEADPHONE JACK
R783 HEADPHONE LEVEL
SWD 5V
AUDIO 11V
R785
D778 POWER
Q752
LED CTL
S701 POWER SW
CN751
CN706
POWER LED
Sa
KS 0
CN752
HEADPHONE LEVEL
HEADPHONE (L)
HERDPHONE (R)
PICTURE SHARP
A B C D E F G H
1 2 3 4 5

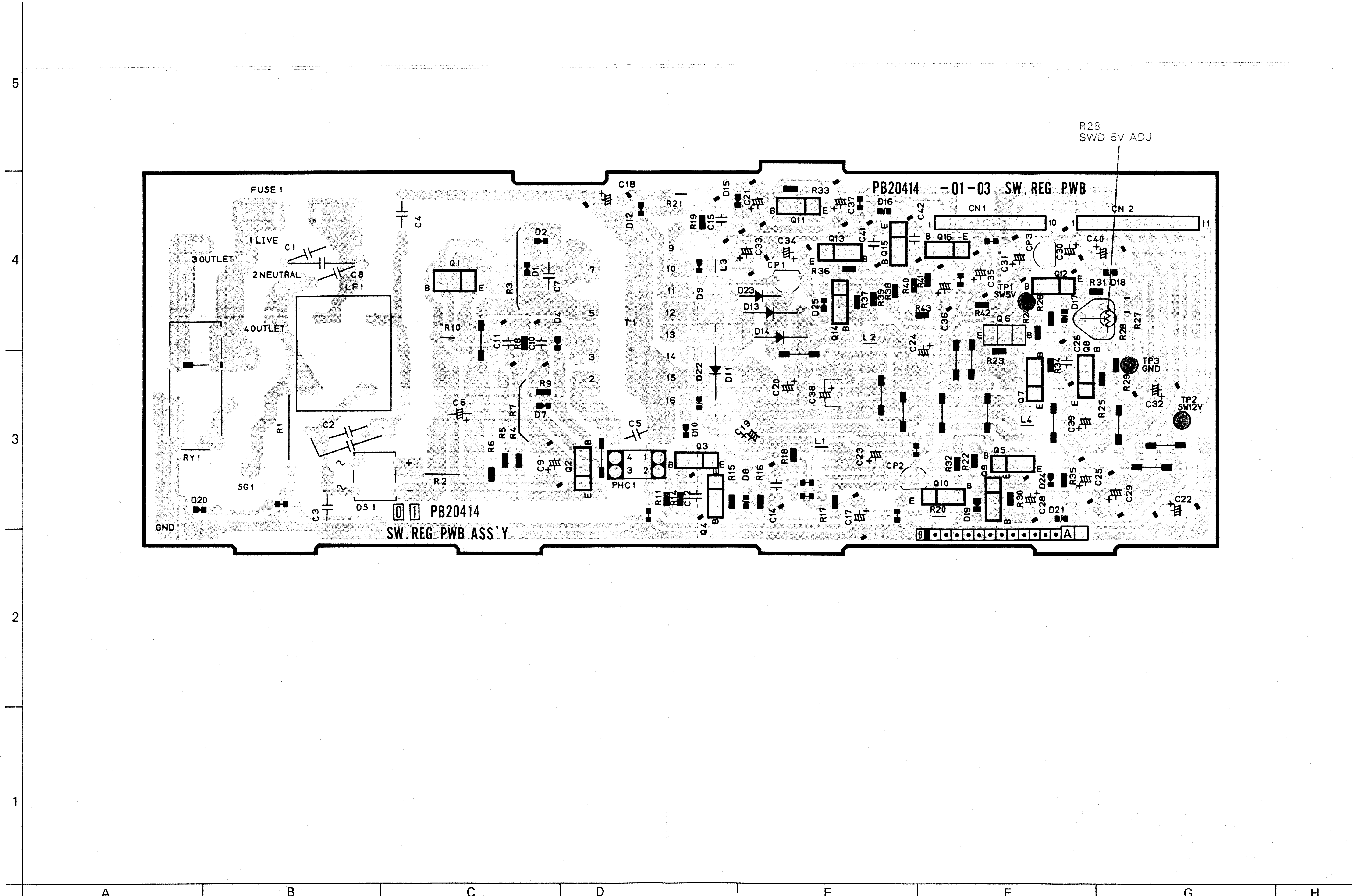
3.15 SWITCHING REGULATOR SCHEMATIC DIAGRAM



01 SWITCHING REGULATOR
03 MAIN (REGULATOR)
T1
Q1 2SC4130
Q2 2SC3616(MLK)
Q9 2SB1425(EU)
Q10 DTB114ES
Q11 2SA720
Q801 2SA1020
Q808
Q804 2SA1576(RS)
DS1 DF04M
LF1
F1 700mA
POWER CORD AC 120V 60Hz
MAIN DECK
MAX 300W AC OUTLET
RY1
D20
PHS1 PC817
TP1 SWD 5V
TP2 SWD 12V
TP3 GND
TP802
R28 SWD5V ADJ
From/To 21 T/D/S, CN703 (Page 3-59)
CN1
-28V(IND)
GND (IND)
-28V
D.C3.2V
D.C3.2V
GND
GND
SWD 5V
UNSW 12V
AC ON LINE
CN2
UNSW 12V
SWD 5V
GND
GND
GND(M)
MOTOR 17V
MOTOR 12V
UNSW 5.8V
SWD 12V
POWER ON/OFF
45V
CN801
From/To 21 T/D/S, CN705 (Page 3-60)
CN803
UNSW 5.8V
CTL CLOCK
DATA
CLOCK
STELEO LED
SAP LED
EDET
SAP CTL
GND
From/To 21 T/D/S, CN701 (Page 3-60)
CN802
SYNC DET
OS CE
OS RESET
OS DATA
PROGRAM
OS CLK
CN902
EE AUDIO (Page 3-38)
EE VIDEO (Page 3-35)
UNSW 12V
SWD 5V
GND
To 03 AUDIO (Page 3-38)
CTL CLOCK
MOTOR 12V
GND (M)
GND
SWD 5V
From/To 05 SERVO (Page 3-45,46)
EE
SWD 5V
GND
GND (M)
MOTOR 17V
MOTOR 12V
UNSW 5.8V
POWER ON/OFF
From/To 03 MECHACON (Page 3-49,50)
T.CLOCK
T.DATA
SWD 5V
GND
GND
EE 12V
45V
From/To 03 TNR IF/CTL (Page 3-42)
RF 5V
GND
To 03 VIDEO (Page 3-35)
VIDEO
From/To 03 MECHACON (Page 3-49)
STELEO LED
SAP LED
SAP CTL IN
From 03 DEMOD (Page 3-44)
EDIT
GND
SWD 12V
SWD 5V
VIDEO
GND
VIDEO
From/To 03 VIDEO (Page 3-35)
SYNC DET
VIDEO
GND
VIDEO
SWD 5V
GND
CS
RESET
SRL DATA
PROG
SRL CLOCK
From/To 17 ON SCREEN, CN901 (Page 3-56)
CP801 ICP-N15-T
CP802 ICP-N10-T
CP803 ICP-N15
CP1 ICP-N10-T
CP2 ICP-N20-T
Q3 2SA933S(S)
Q4 2SC1174OS(S)
Q5 2SD1468S(RS)
Q6 2SB941P
Q7 2SC1740S(Q)
Q8 2SC1740S
Q12 2SA933S
D9 11EFS2
D25 11ES2
D10 AU01Z
D11 RL4Z-LFK2
D22 RD15ES-T1B1
D12 AU01Z
D23 11EFS2
D13 RK14LF-B2
D14 RK14LF-B2
D15 RD30ES-T1B1
D16 RD8.2ES-T1B1
D19
D21 RD6.8ES-T1B1
D17 UZ5.1BSC
D8 MTZV6.2A
D24
D7 RD15ES-T1B3
D1 AU01
D2 AG01
D4 AU01Z
R1 2.2M 1/2W
R2 1 2W
R3 68K 2W
R4 68K
R5 68K
R6 47K
R7 100 1W
R8 1K
R9 1.2K
R10 0.27 1W
R11 470
R14 470
R15 820
R16 475
R17 432
R18 4.7K
R19 33K
R20 100 1/4W FR
R21 47 1/4W FR
R22 1K
R23 10K
R24 220
R25 470
R26 4.7K
R27 1K
R28 470
R29 10K
R30 10K
R32 1K
R33 2.2K
R34 8.2K
R35 1K
R801 2.2K
R804 1.8K
R806 39K
R807 4.7K
R809 10K
L1 33
L2 33
L3 33
L4 33
L801 100
C1 0.01
C2 0.01
C3 0.001
C4 0.001
C5 0.0022
C6 100/200
C7 0.0047
C8 0.01
C9 4.7/50
C10 0.33
C11 0.0047
C12 0.01
C14 0.1
C15 0.01
C17 47/63
C18 47/50
C19 680/16
C20 1200/10
C21 22/50
C22 22/63
C23 1000/16
C24 1500/10
C25 100/10
C26 0.01
C28 100/6.3
C29 100/16
C30 100/10
C31 100/16
C32 100/16
C33 120/6.3
C34 100/6.3
C37 22/35
C38 470/25
C39 470/25
C40 22/10
C801 33/16
C821 33/16
1
2
3
4
5
A
B
C
D
E
F
G
H

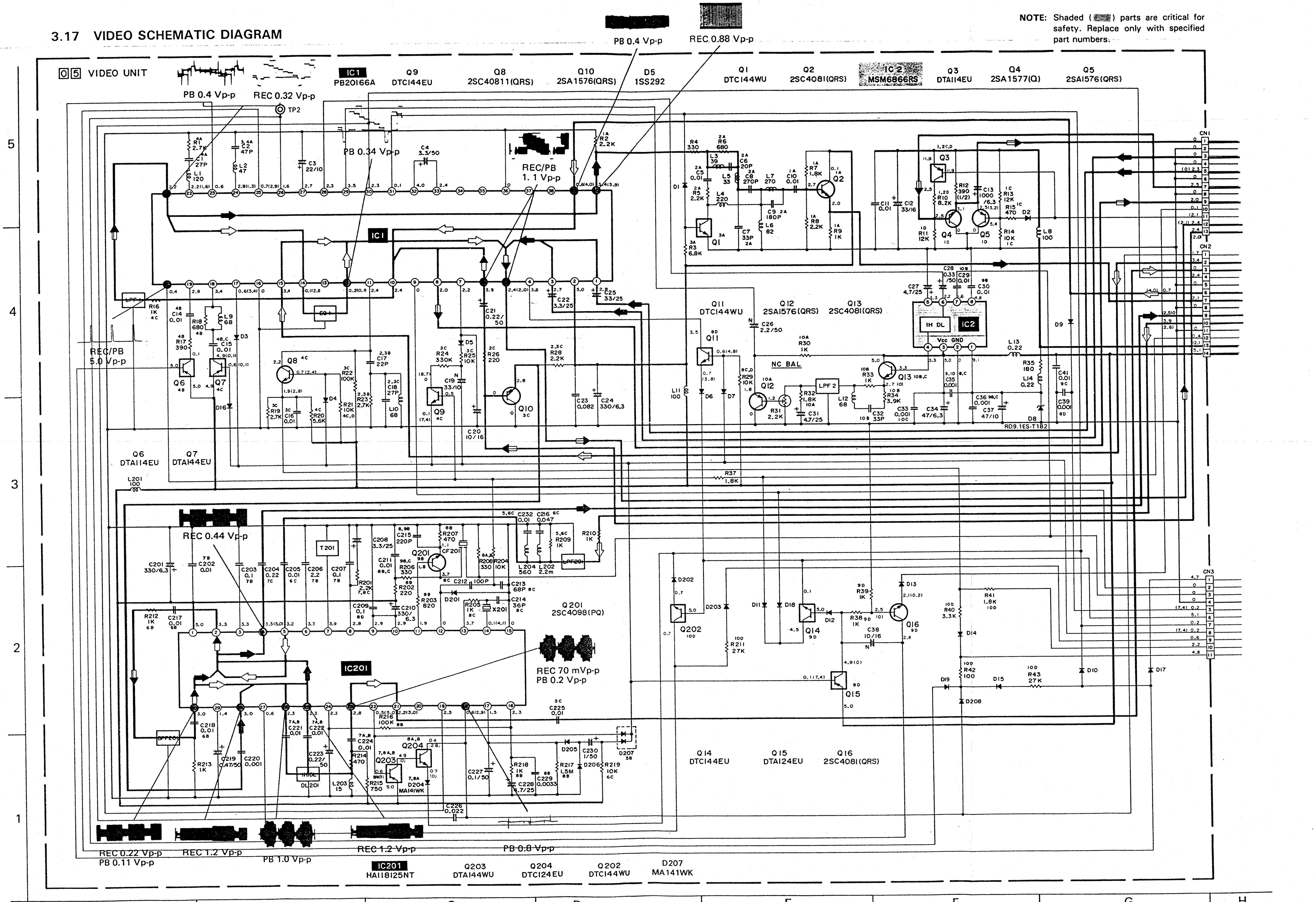
NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

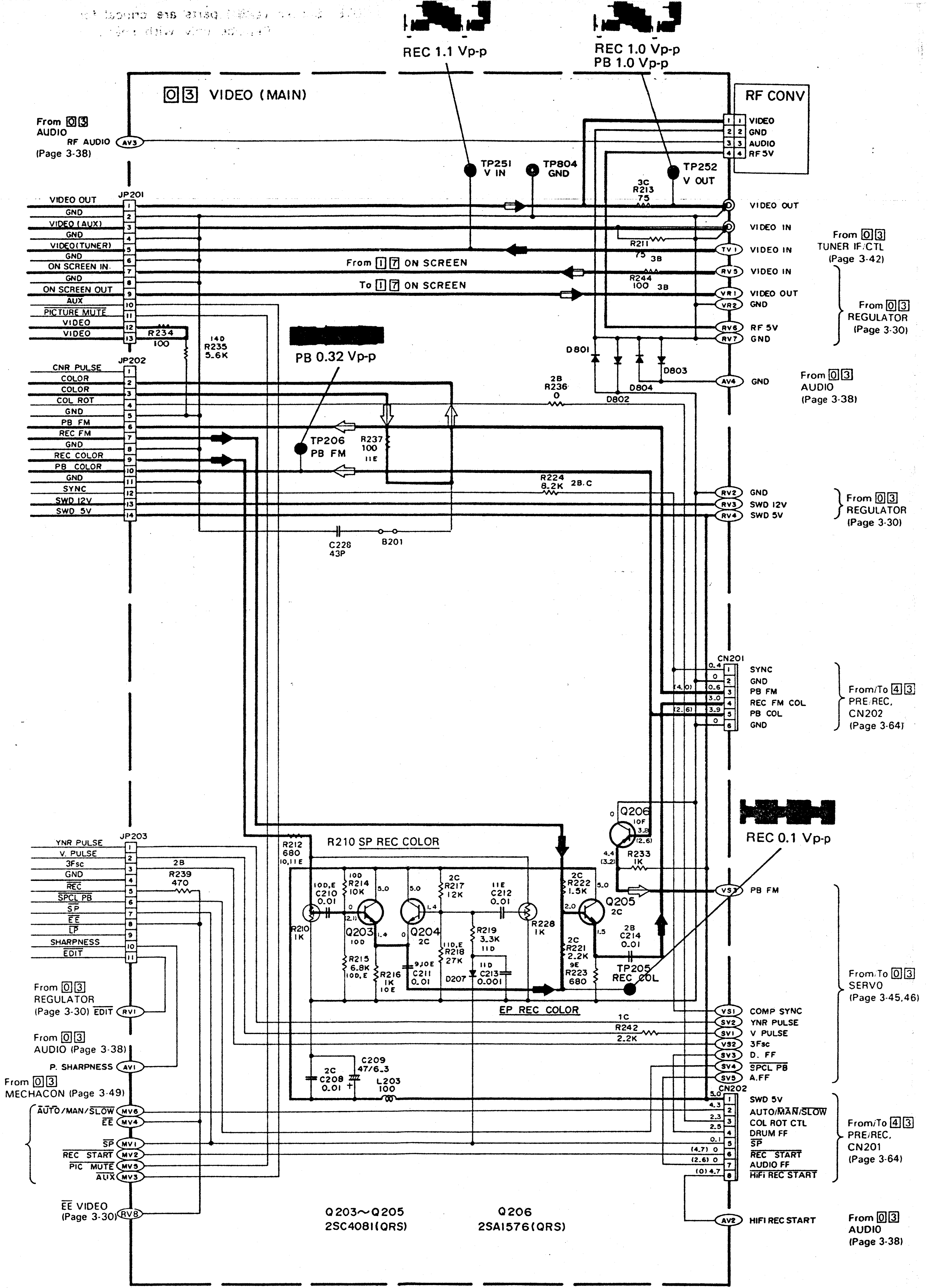
3.16 SWITCHING REGULATOR CIRCUIT BOARD


R28
SWD 5V ADJ
PB20414 -01-03 SW. REG PWB
0 1 PB20414
SW. REG PWB ASS'Y
FUSE 1
1 LIVE
2 NEUTRAL
3 OUTLET
4 OUTLET
RY 1
SG1
GND
D20
R1
C1
C2
C3
C4
C8
LF1
DS1
R2
Q1
R3
R10
D1
D2
C7
D4
C11
R8
C10
R9
D7
R7
C6
R5
R4
R6
C9
Q2
T1
PHC1
C5
C18
D12
R21
R19
C15
L3
D9
D10
D22
D11
Q3
R11
R14
C12
Q4
R15
D8
R16
C14
R18
R17
C17
D15
C21
R33
Q11
C37
D16
C42
C33
C34
CP1
Q13
C41
Q15
R36
D23
D13
D14
D25
Q14
R37
R39
R38
C20
C38
C19
L1
C23
CP2
R40
R41
R43
C36
L2
C24
CN 1
CN 2
Q16
C31
CP3
C35
TP1
SW5V
R42
Q6
R24
R26
R23
Q7
C30
C40
Q12
R31
D18
D17
R28
R27
C26
Q8
R34
TP3
GND
R29
C32
TP2
SW12V
R25
C39
L4
Q5
R32
R22
Q9
Q10
R20
D19
R30
C28
D24
D21
R35
C25
C29
C22
A
B
C
D
E
F
G
H
1
2
3
4
5

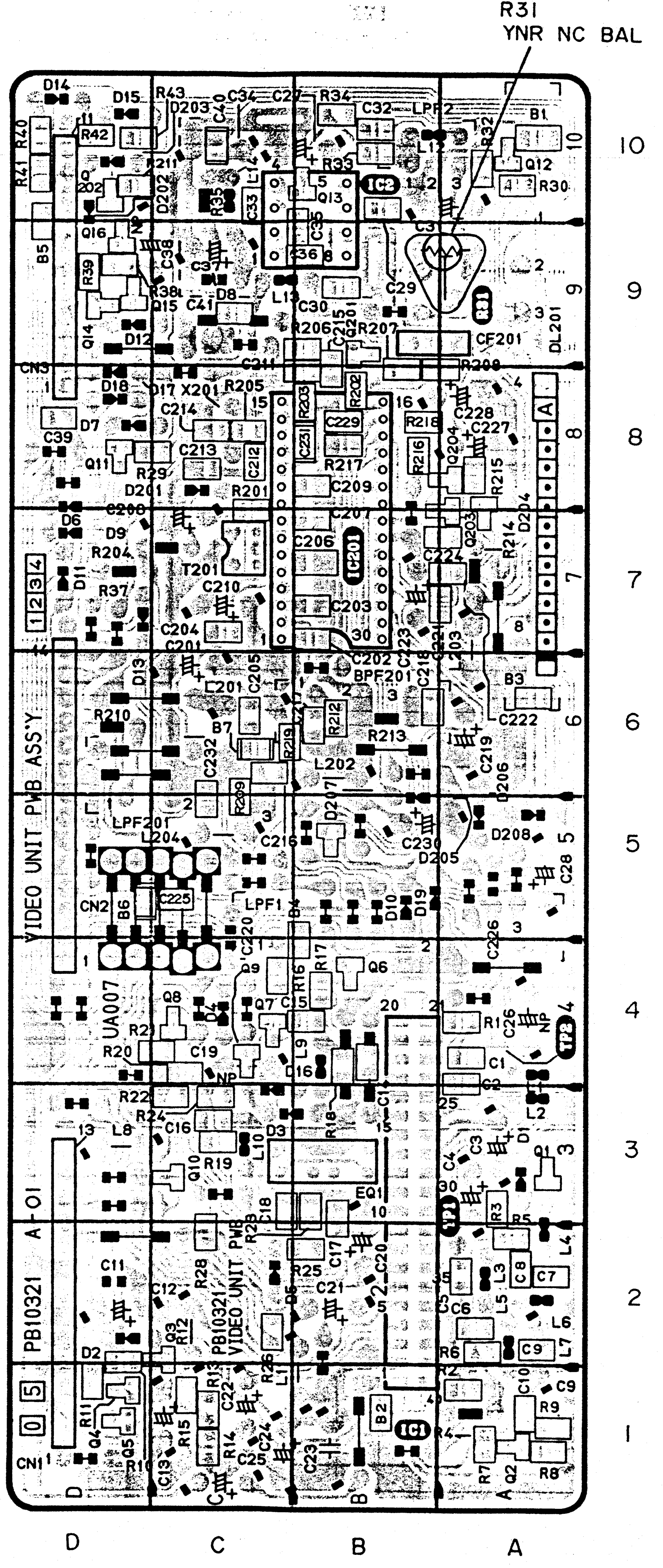
3.17 VIDEO SCHEMATIC DIAGRAM

NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.


PB 0.4 Vp-p
REC 0.88 Vp-p
05 VIDEO UNIT
PB 0.4 Vp-p
REC 0.32 Vp-p
TP2
IC1 PB20166A
Q9 DTC144EU
Q8 2SC4081I(QRS)
Q10 2SA1576(QRS)
D5 1SS292
Q1 DTC144WU
Q2 2SC4081(QRS)
IC2 MSM6866RS
Q3 DTA114EU
Q4 2SA1577(Q)
Q5 2SA1576(QRS)
PB 0.34 Vp-p
REC/PB 1.1 Vp-p
REC/PB 5.0 Vp-p
LPF1
EQ1
Q11 DTC144WU
Q12 2SA1576(QRS)
Q13 2SC4081(QRS)
1H DL
NC BAL
LPF 2
RD9.1ES-T1B2
CN1
CN2
CN3
Q6 DTA114EU
Q7 DTA144EU
L201 100
REC 0.44 Vp-p
T201
Q201 2SC4098(PQ)
CF201
X201
LPF201
IC201
REC 70 mVp-p
PB 0.2 Vp-p
BPF201
1H DL DL201
Q203
Q204
D204 MA141WK
D207
Q202
Q14 DTC144EU
Q15 DTA124EU
Q16 2SC4081(QRS)
REC 0.22 Vp-p
PB 0.11 Vp-p
REC 1.2 Vp-p
PB 1.0 Vp-p
REC 1.2 Vp-p
PB 0.8 Vp-p
IC201 HA118125NT
Q203 DTA144WU
Q204 DTC124EU
Q202 DTC144WU
D207 MA141WK
A
B
C
D
E
F
G
H
1
2
3
4
5

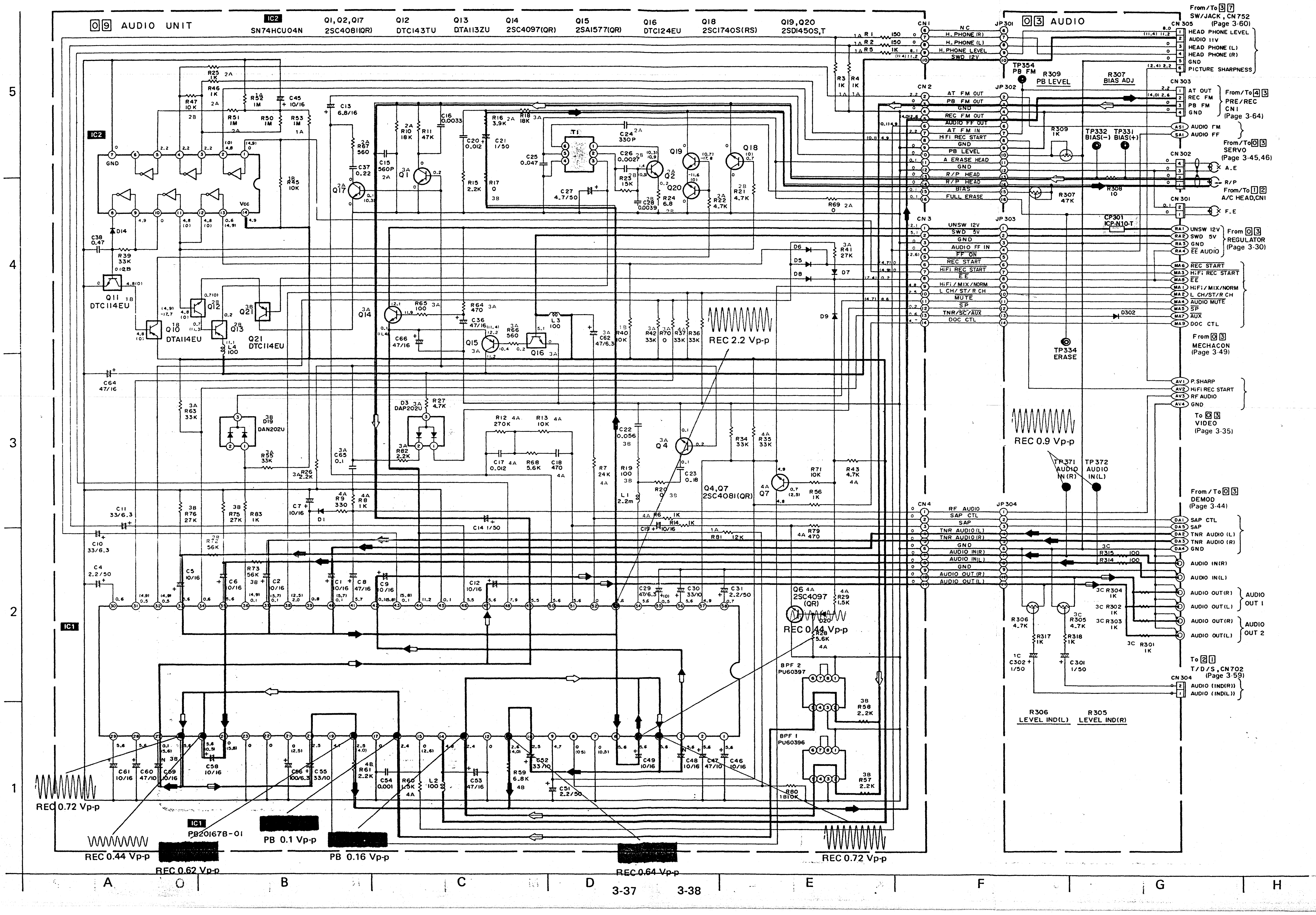

REC 1.1 Vp-p
REC 1.0 Vp-p
PB 1.0 Vp-p
03 VIDEO (MAIN)
RF CONV
VIDEO
GND
AUDIO
RF 5V
From 03 AUDIO RF AUDIO (Page 3-38)
TP251 V IN
TP804 GND
TP252 V OUT
JP201
VIDEO OUT
GND
VIDEO (AUX)
GND
VIDEO(TUNER)
GND
ON SCREEN IN
GND
ON SCREEN OUT
AUX
PICTURE MUTE
VIDEO
VIDEO
R234 100
R235 5.6K
R213 75
R211 75
R244 100
From 17 ON SCREEN
To 17 ON SCREEN
VIDEO OUT
VIDEO IN
VIDEO IN
VIDEO IN
VIDEO OUT
GND
RF 5V
GND
From 03 TUNER IF/CTL (Page 3-42)
From 03 REGULATOR (Page 3-30)
D801
D802
D803
D804
PB 0.32 Vp-p
R236 0
From 03 AUDIO (Page 3-38)
JP202
CNR PULSE
COLOR
COLOR
COL ROT
GND
PB FM
REC FM
GND
REC COLOR
PB COLOR
GND
SYNC
SWD 12V
SWD 5V
TP206 PB FM
R237 100
R224 8.2K
GND
SWD 12V
SWD 5V
From 03 REGULATOR (Page 3-30)
C228 43P
B201
CN201
SYNC
GND
PB FM
REC FM COL
PB COL
GND
From/To 43 PRE/REC, CN202 (Page 3-64)
REC 0.1 Vp-p
JP203
YNR PULSE
V. PULSE
3Fsc
GND
REC
SPCL PB
SP
EE
LP
SHARPNESS
EDIT
R239 470
R212 680
R210 SP REC COLOR
R210 1K
C210 0.01
R214 10K
Q203
R215 6.8K
R216 1K
Q204
C211 0.01
R217 12K
R218 27K
R219 3.3K
D207
C212 0.01
C213 0.001
R228 1K
R222 1.5K
R221 2.2K
R223 680
Q205
C214 0.01
Q206
R233 1K
TP205 REC COL
PB FM
EP REC COLOR
R242 2.2K
From 03 REGULATOR (Page 3-30) EDIT
From 03 AUDIO (Page 3-38)
P. SHARPNESS
From 03 MECHACON (Page 3-49)
AUTO/MAN/SLOW
EE
SP
REC START
PIC MUTE
AUX
C208 0.01
C209 47/6.3
L203 100
COMP SYNC
YNR PULSE
V PULSE
3Fsc
D. FF
SPCL PB
A.FF
From/To 03 SERVO (Page 3-45,46)
CN202
SWD 5V
AUTO/MAN/SLOW
COL ROT CTL
DRUM FF
SP
REC START
AUDIO FF
HiFi REC START
From/To 43 PRE/REC, CN201 (Page 3-64)
EE VIDEO (Page 3-30)
HIFI REC START
From 03 AUDIO (Page 3-38)
Q203~Q205 2SC4081(QRS)
Q206 2SA1576(QRS)

3.18 VIDEO CIRCUIT BOARD


R31 YNR NC BAL
VIDEO UNIT PWB ASS'Y
PB10321 A-01
05
UA007
CN1
CN2
CN3
IC1
IC2
IC201
BPF201
LPF1
LPF2
LPF201
T201
X201
DL201
CF201
L202
10
9
8
7
6
5
4
3
2
1
D
C
B
A

3.19 AUDIO UNIT SCHEMATIC DIAGRAM

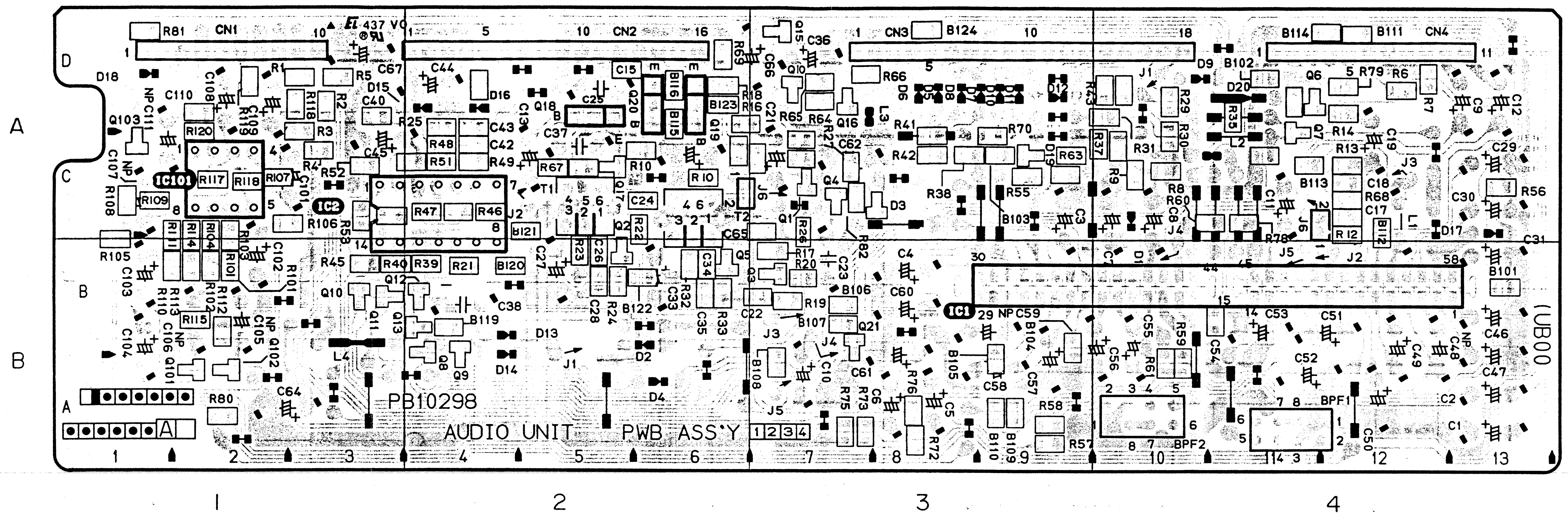
NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.



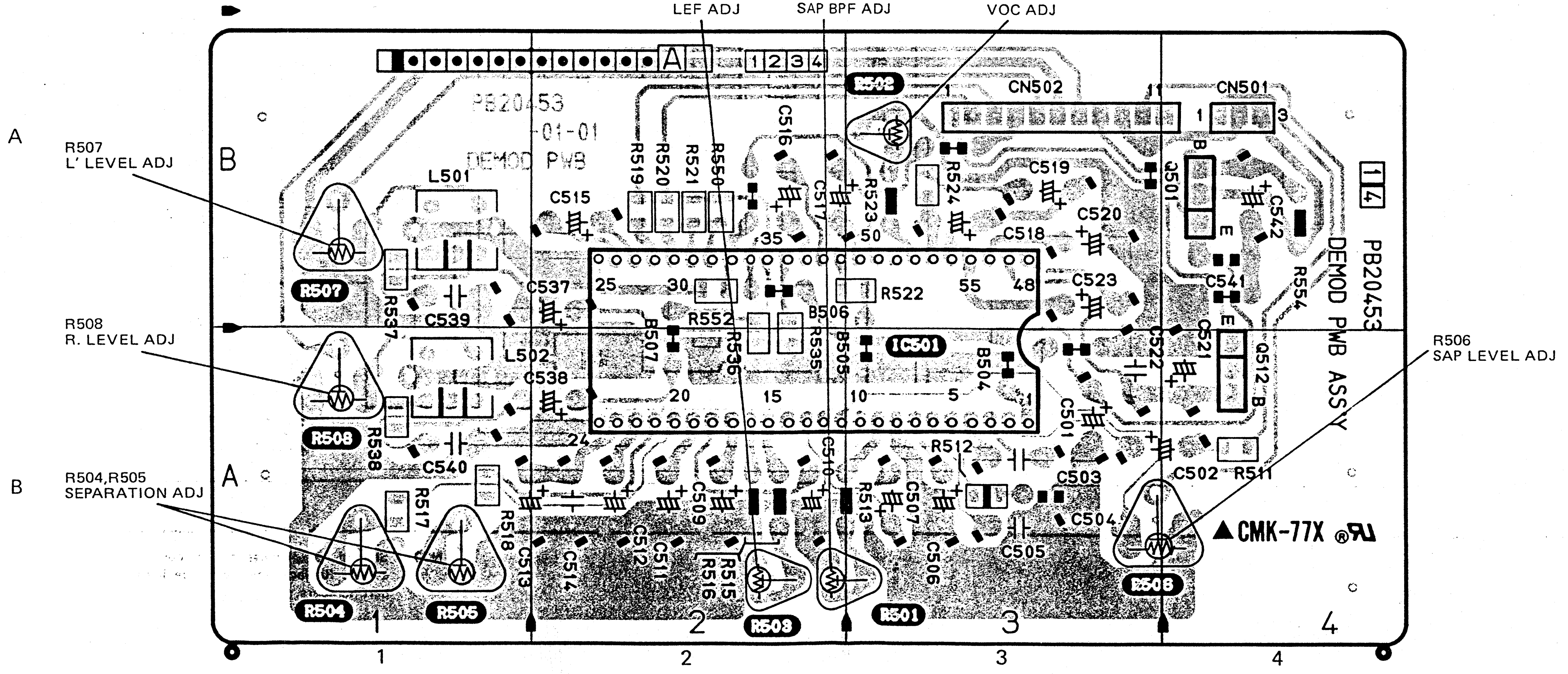
09 AUDIO UNIT
IC2 SN74HCU04N
Q1,Q2,Q17 2SC4081(QR)
Q12 DTC143TU
Q13 DTA113ZU
Q14 2SC4097(QR)
Q15 2SA1577(QR)
Q16 DTC124EU
Q18 2SC1740S(RS)
Q19,Q20 2SD1450S,T
03 AUDIO
CN1
JP301
CN2
JP302
CN3
JP303
CN4
JP304
N C
H. PHONE (R)
H. PHONE (L)
H. PHONE LEVEL
SWD 12V
AT FM OUT
PB FM OUT
GND
REC FM OUT
AUDIO FF OUT
AT FM IN
HiFi REC START
PB LEVEL
A ERASE HEAD
R/P HEAD
BIAS
FULL ERASE
UNSW 12V
SWD 5V
AUDIO FF IN
FF ON
REC START
E E
HiFi/MIX/NORM
L CH/ST/R CH
MUTE
SP
TNR/SC/AUX
DOC CTL
RF AUDIO
SAP CTL
SAP
TNR AUDIO(L)
TNR AUDIO(R)
AUDIO IN(R)
AUDIO IN(L)
AUDIO OUT(R)
AUDIO OUT(L)
From/To 37 SW/JACK, CN752 (Page 3-60)
CN305
HEAD PHONE LEVEL
AUDIO 11V
HEAD PHONE (L)
HEAD PHONE (R)
PICTURE SHARPNESS
TP354 PB FM
R309 PB LEVEL
R307 BIAS ADJ
CN303
AT OUT
REC FM
PB FM
From/To 43 PRE/REC CN1 (Page 3-64)
AS1 AUDIO FM
SA1 AUDIO FF
TP332 BIAS(−)
TP331 BIAS(+)
From/To 03 SERVO (Page 3-45,46)
CN302
A.E
R/P
From/To 12 A/C HEAD,CN1
CN301
F.E
CP301 ICP-N10-T
R308 10
R307 47K
R309 1K
RA1 UNSW 12V
RA2 SWD 5V
RA3 GND
RA4 EE AUDIO
From 03 REGULATOR (Page 3-30)
MA6 REC START
MA3 HiFi REC START
MA8 EE
MA1 HiFi/MIX/NORM
MA2 L CH/ST/R CH
MA4 AUDIO MUTE
MA5 SP
MA7 AUX
MA9 DOC CTL
D302
From 03 MECHACON (Page 3-49)
TP334 ERASE
AV1 P.SHARP
AV2 HiFi REC START
AV3 RF AUDIO
AV4 GND
To 03 VIDEO (Page 3-35)
REC 0.9 Vp-p
TP371 AUDIO IN(R)
TP372 AUDIO IN(L)
From/To 03 DEMOD (Page 3-44)
DA1 SAP CTL
DA5 SAP
DA2 TNR AUDIO (L)
DA3 TNR AUDIO (R)
DA4 GND
R315 100
R314 100
AUDIO IN(R)
AUDIO IN(L)
AUDIO OUT(R)
AUDIO OUT(L)
AUDIO OUT 1
AUDIO OUT 2
R304 1K
R302 1K
R303 1K
R301 1K
R306 4.7K
R305 4.7K
R317 1K
R318 1K
C302 1/50
C301 1/50
To 21 T/D/S, CN702 (Page 3-59)
CN304
AUDIO (IND(R))
AUDIO (IND(L))
R306 LEVEL IND(L)
R305 LEVEL IND(R)
IC2
IC1 PB20167B-01
Q11 DTC114EU
Q10 DTA114EU
Q12
Q13
Q21 DTC114EU
Q14
Q15
Q16
Q17
Q1
Q19
Q20
Q18
Q2
Q4
Q7
Q4,Q7 2SC4081(QR)
Q6 2SC4097 (QR)
T1
D14
D19 DAN202U
D3 DAP202U
D1
D6
D5
D8
D7
D9
D20
L1 2.2m
L2 100
L3 100
L4 100
BPF 2 PU60397
BPF 1 PU60396
R25 1K
R46 1K
R47 10K
R52 1M
R51 1M
R50 1M
R53 1M
R45 10K
R67 560
R10 18K
R11 47K
R16 3.9K
R18 18K
R15 2.2K
R17 0
R23 15K
R24 6.8
R22 4.7K
R21 4.7K
R3 1K
R4 1K
R1 150
R2 150
R5 1K
R41 27K
R69 0
R39 33K
R65 100
R64 470
R66 560
R40 10K
R42 33K
R70 0
R37 33K
R36 33K
R63 33K
R27 4.7K
R55 33K
R82 2.2K
R26 2.2K
R12 270K
R13 10K
R68 5.6K
R9 330
R8 1K
R7 24K
R19 100
R20 0
R34 33K
R35 33K
R71 10K
R43 4.7K
R56 1K
R76 27K
R75 27K
R83 1K
R72 56K
R73 56K
R6 1K
R14 1K
R81 12K
R79 470
R29 1.5K
R28 5.6K
R58 2.2K
R57 2.2K
R80 1810K
R61 2.2K
R60 1.5K
R59 6.8K
C45 10/16
C13 6.8/16
C37 0.22
C15 560P
C16 0.0033
C20 0.012
C21 1/50
C25 0.047
C24 330P
C26 0.0027
C28 0.0039
C27 4.7/50
C38 0.47
C36 47/16
C66 47/16
C62 47/6.3
C64 47/16
C65 0.1
C17 0.012
C18 470
C22 0.056
C23 0.18
C11 33/6.3
C10 33/6.3
C4 2.2/50
C7 10/16
C14 1/50
C19 10/16
C5 10/16
C6 10/16
C2 10/16
C1 10/16
C8 47/16
C9 10/16
C12 10/16
C29 47/6.3
C30 33/10
C31 2.2/50
C61 10/16
C60 47/10
C59 10/16
C58 10/16
C56 100/6.3
C55 33/10
C54 0.001
C53 47/16
C52 33/10
C51 2.2/50
C49 10/16
C48 10/16
C47 47/10
C46 10/16
GND
Vcc
REC 2.2 Vp-p
REC 0.44 Vp-p
REC 0.72 Vp-p
REC 0.44 Vp-p
REC 0.62 Vp-p
PB 0.1 Vp-p
PB 0.16 Vp-p
REC 0.64 Vp-p
REC 0.72 Vp-p
A
B
C
D
E
F
G
H
1
2
3
4
5

3.20 AUDIO UNIT AND DEMODULATOR CIRCUIT BOARDS

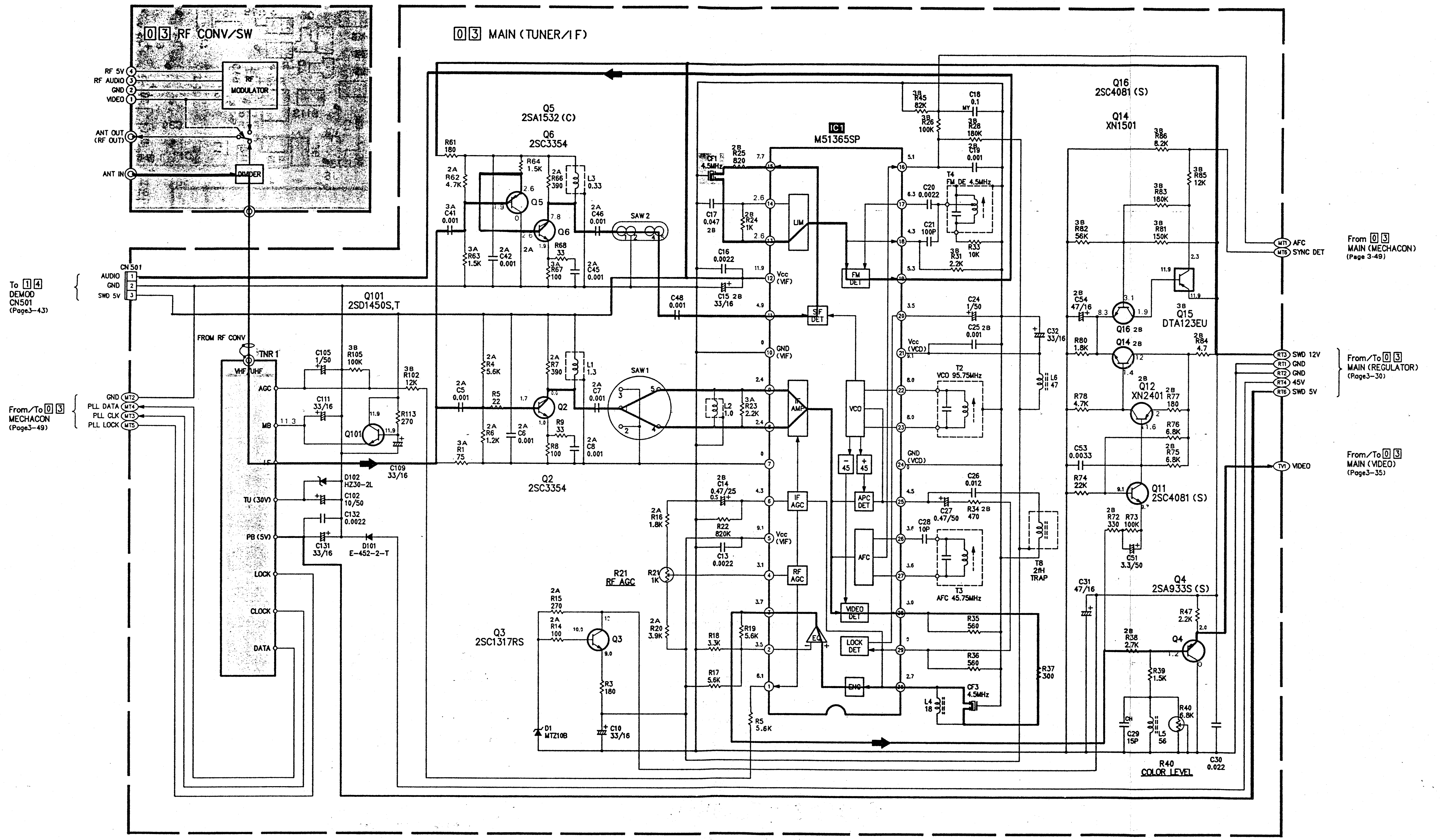
—AUDIO UNIT—


CN1
CN2
CN3
CN4
IC101
IC2
IC1
PB10298
AUDIO UNIT PWB ASS'Y
BPF1
BPF2
(UB00

—DEMODULATOR—


R503
LEF ADJ
R501
SAP BPF ADJ
R502
VOC ADJ
R507
L' LEVEL ADJ
R508
R. LEVEL ADJ
R504,R505
SEPARATION ADJ
R506
SAP LEVEL ADJ
CN502
CN501
IC501
PB20453
01-01
DEMOD PWB
PB20453
DEMOD PWB ASS'Y
CMK-77X

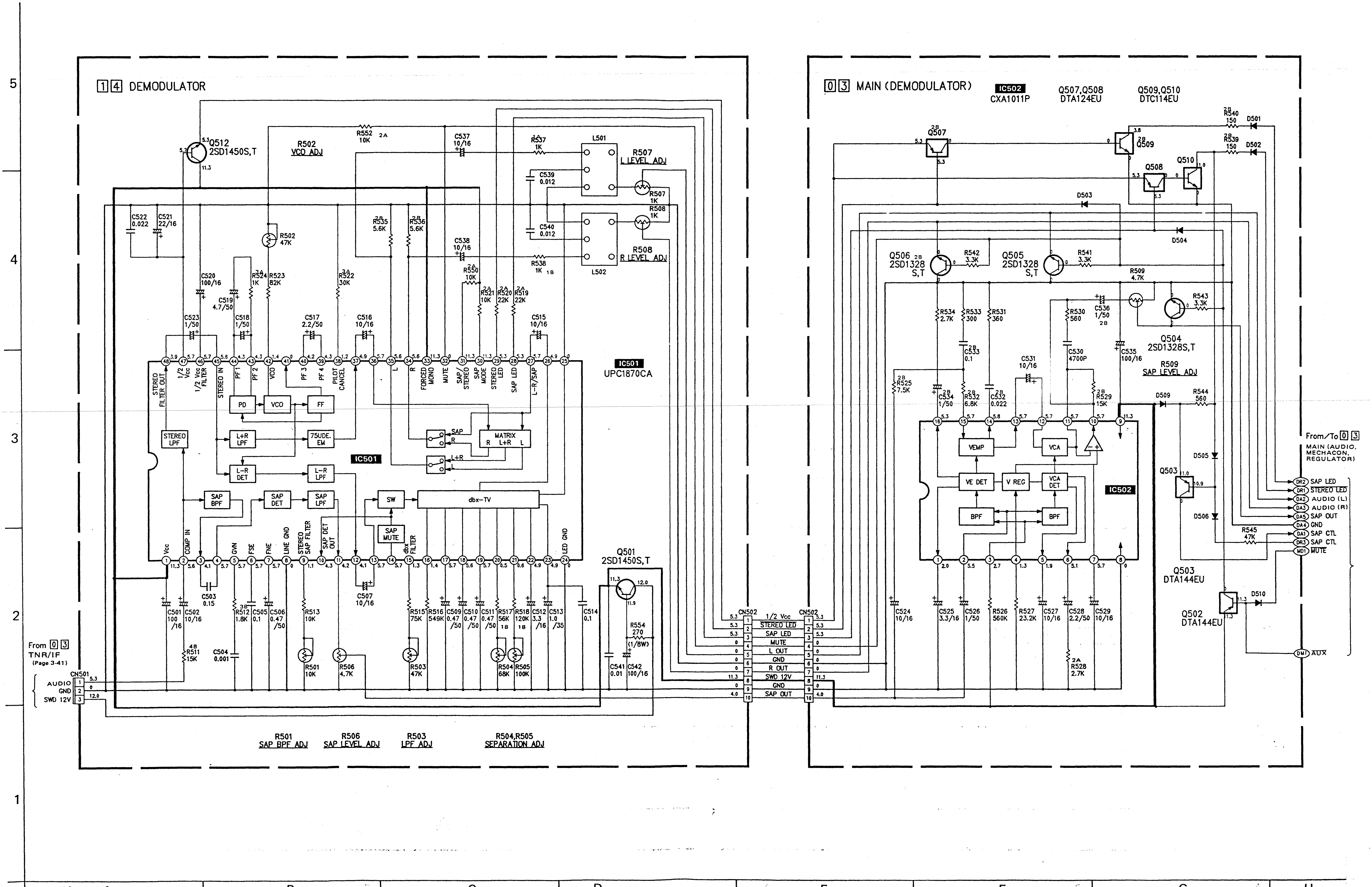
3.21 TUNER/IF SCHEMATIC DIAGRAMS



03 RF CONV/SW
RF 5V
RF AUDIO
GND
VIDEO
RF MODULATOR
ANT OUT (RF OUT)
ANT IN
DIVIDER
03 MAIN (TUNER/IF)
To 14 DEMOD CN501 (Page3-43)
CN501
AUDIO
GND
SWD 5V
From/To 03 MECHACON (Page3-49)
GND
PLL DATA
PLL CLK
PLL LOCK
FROM RF CONV
TNR1
VHF/UHF
AGC
MB
TU (30V)
PB (5V)
LOCK
CLOCK
DATA
Q101 2SD1450S,T
C105 1/50
R105 100K
R102 12K
C111 33/16
R113 270
C109 33/16
D102 HZ30-2L
C102 10/50
C132 0.0022
C131 33/16
D101 E-452-2-T
Q5 2SA1532 (C)
Q6 2SC3354
R61 180
R62 4.7K
R64 1.5K
R66 390
L3 0.33
C41 0.001
R63 1.5K
C42 0.001
R68 33
R67 100
C46 0.001
C45 0.001
SAW 2
R4 5.6K
C5 0.001
R5 22
R6 1.2K
C6 0.001
R1 75
R7 390
L1 1.3
C7 0.001
R9 33
R8 100
C8 0.001
Q2 2SC3354
SAW1
Q3 2SC1317RS
R15 270
R14 100
R3 180
D1 MTZ10B
C10 33/16
R21 RF AGC
R21 1K
R16 1.8K
R20 3.9K
IC1 M51365SP
CF1 4.5MHz
R25 820
C17 0.047
R24 1K
C16 0.0022
C15 33/16
C48 0.001
Vcc (VIF)
GND (VIF)
LIM
SIF DET
FM DET
L2 1.0
R23 2.2K
IF AMP
C14 0.47/25
R22 820K
C13 0.0022
IF AGC
RF AGC
R18 3.3K
R19 5.6K
R17 5.6K
R5 5.6K
EQ
VCO
-45
+45
APC DET
AFC
VIDEO DET
LOCK DET
ENG
R45 82K
R26 100K
C18 0.1
R28 180K
C19 0.001
T4 FM DE 4.5MHz
C20 0.0022
C21 100P
R31 2.2K
R33 10K
C24 1/50
C25 0.001
Vcc (VCO)
GND (VCO)
T2 VCO 95.75MHz
C26 0.012
C27 0.47/50
R34 470
C28 10P
T3 AFC 45.75MHz
R35 560
R36 560
R37 300
CF3 4.5MHz
L4 18
C32 33/16
L6 47
T8 2fH TRAP
Q16 2SC4081 (S)
Q14 XN1501
R86 8.2K
R85 12K
R83 180K
R82 56K
R81 150K
Q15 DTA123EU
C54 47/16
R80 1.8K
R84 4.7
Q12 XN2401
R77 180
R78 4.7K
R76 6.8K
R75 6.8K
C53 0.0033
R74 22K
Q11 2SC4081 (S)
R72 330
R73 100K
C51 3.3/50
C31 47/16
Q4 2SA933S (S)
R47 2.2K
R38 2.7K
R39 1.5K
R40 6.8K
C29 15P
L5 56
C30 0.022
R40 COLOR LEVEL
AFC
SYNC DET
From 03 MAIN (MECHACON) (Page 3-49)
SWD 12V
GND
GND
45V
SWD 5V
From/To 03 MAIN (REGULATOR) (Page3-30)
VIDEO
From/To 03 MAIN (VIDEO) (Page3-35)
A
B
C
D
E
F
G
H
1
2
3
4
5

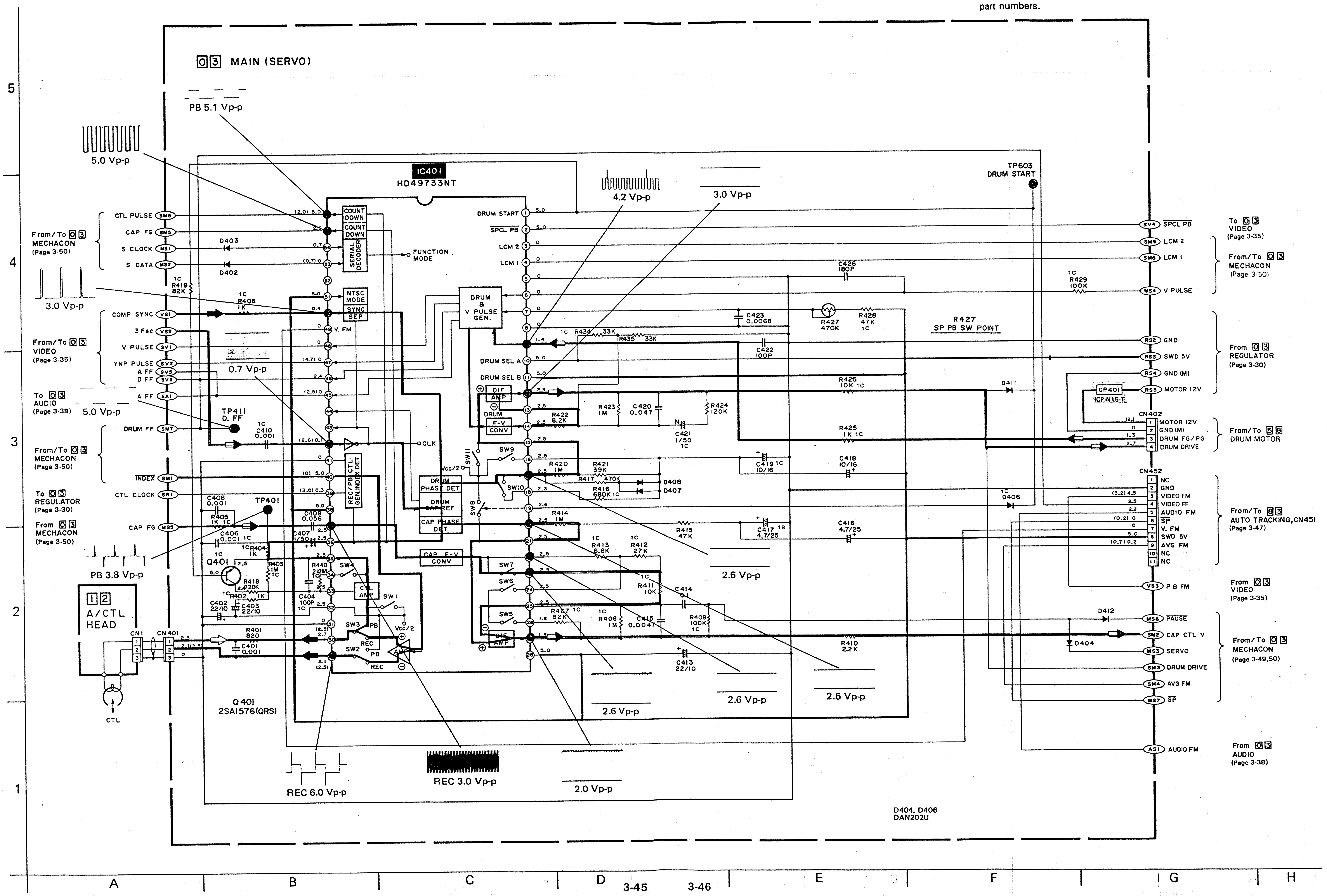
NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

3.22 DEMODULATOR SCHEMATIC DIAGRAM

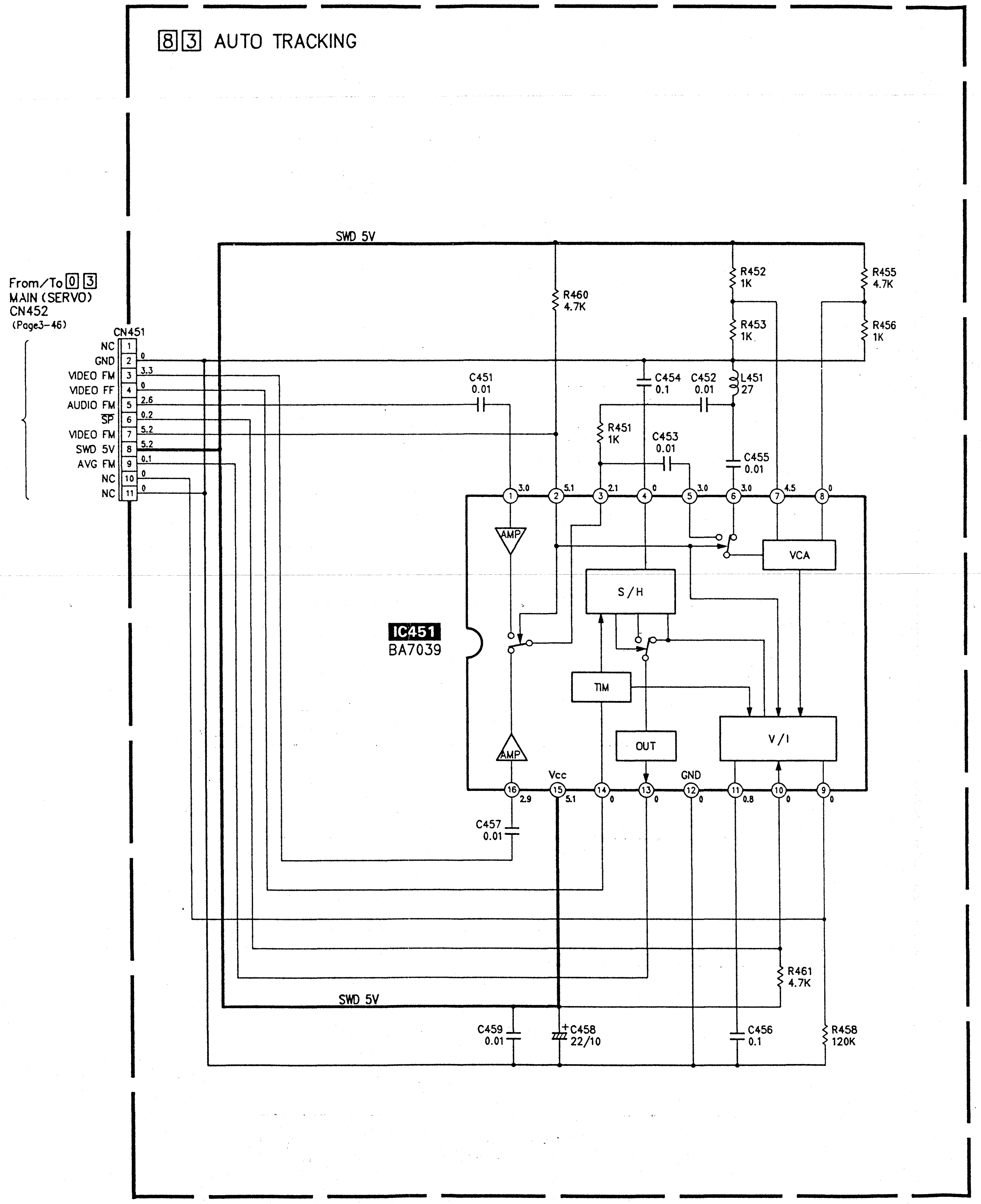

14 DEMODULATOR
03 MAIN (DEMODULATOR)
IC502 CXA1011P
Q507,Q508 DTA124EU
Q509,Q510 DTC114EU
IC501 UPC1870CA
IC501
IC502
Q512 2SD1450S,T
Q501 2SD1450S,T
Q506 2SD1328 S,T
Q505 2SD1328 S,T
Q504 2SD1328S,T
Q503 DTA144EU
Q502 DTA144EU
Q507
Q508
Q509
Q510
R502 VCO ADJ
R507 L LEVEL ADJ
R508 R LEVEL ADJ
R509 SAP LEVEL ADJ
R501 SAP BPF ADJ
R506 SAP LEVEL ADJ
R503 LPF ADJ
R504,R505 SEPARATION ADJ
L501
L502
STEREO FILTER OUT
1/2 Vcc
1/2 Vcc FILTER
STEREO IN
PF 1
PF 2
VCO
PF 3
PF 4
PILOT CANCEL
L
R
FORCED MONO
MUTE
SAP/STEREO
SAP MODE
STEREO LED
SAP LED
L-R/SAP
Vcc
COMP IN
GVN
FSE
FNE
LINE GND
STEREO SAP FILTER
SAP DET OUT
dbx FILTER
LED GND
PD
VCO
FF
STEREO LPF
L+R LPF
75UDE. EM
MATRIX R L+R L
SAP
L+R
L-R DET
L-R LPF
SAP BPF
SAP DET
SAP LPF
SW
SAP MUTE
dbx-TV
VEMP
VCA
VE DET
V REG
VCA DET
BPF
CN501
AUDIO
GND
SWD 12V
From 03 TNR/IF (Page 3-41)
CN502
1/2 Vcc
STEREO LED
SAP LED
MUTE
L OUT
GND
R OUT
SWD 12V
GND
SAP OUT
From/To 03 MAIN (AUDIO, MECHACON, REGULATOR)
SAP LED
STEREO LED
AUDIO (L)
AUDIO (R)
SAP OUT
GND
SAP CTL
SAP CTL
MUTE
AUX
DR2
DR1
DA2
DA3
DA5
DA4
DA1
DR3
MD1
DM7
D501
D502
D503
D504
D505
D506
D509
D510
R552 10K
C537 10/16
R537 1K
C539 0.012
C540 0.012
R507 1K
R508 1K
C538 10/16
R538 1K
R535 5.6K
R536 5.6K
R550 10K
R521 10K
R520 22K
R519 22K
C522 0.022
C521 22/16
R502 47K
C520 100/16
C519 4.7/50
R524 1K
R523 82K
R522 30K
C523 1/50
C518 1/50
C517 2.2/50
C516 10/16
C515 10/16
C501 100/16
C502 10/16
C503 0.15
R512 1.8K
C505 0.1
C506 0.47/50
R513 10K
C507 10/16
R515 75K
R516 549K
C509 0.47/50
C510 0.47/50
C511 0.47/50
R517 56K
R518 120K
C512 3.3/16
C513 1.0/35
C514 0.1
R511 15K
C504 0.001
R501 10K
R506 4.7K
R503 47K
R504 68K
R505 100K
R554 270 (1/8W)
C541 0.01
C542 100/16
R540 150
R539 150
R542 3.3K
R541 3.3K
R509 4.7K
R543 3.3K
R534 2.7K
R533 300
R531 360
R530 560
C536 1/50
C533 0.1
C530 4700P
C535 100/16
R525 7.5K
C534 1/50
R532 6.8K
C532 0.022
C531 10/16
R529 15K
R544 560
R545 47K
C524 10/16
C525 3.3/16
C526 1/50
R526 560K
R527 23.2K
C527 10/16
C528 2.2/50
C529 10/16
R528 2.7K
1
2
3
4
5
A
B
C
D
E
F
G
H

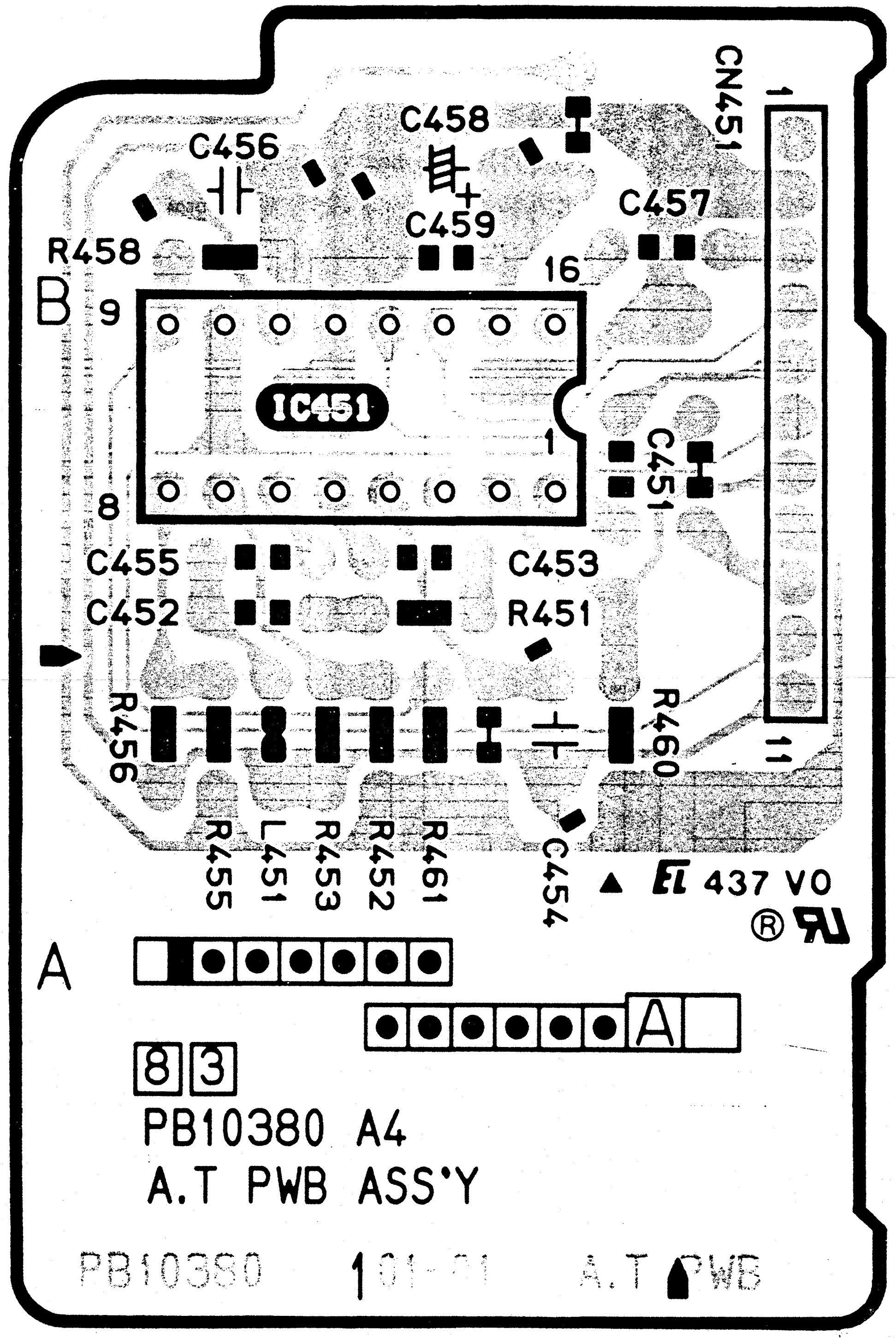
3.23 SERVO AND AUTO TRACKING SCHEMATIC DIAGRAMS

NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

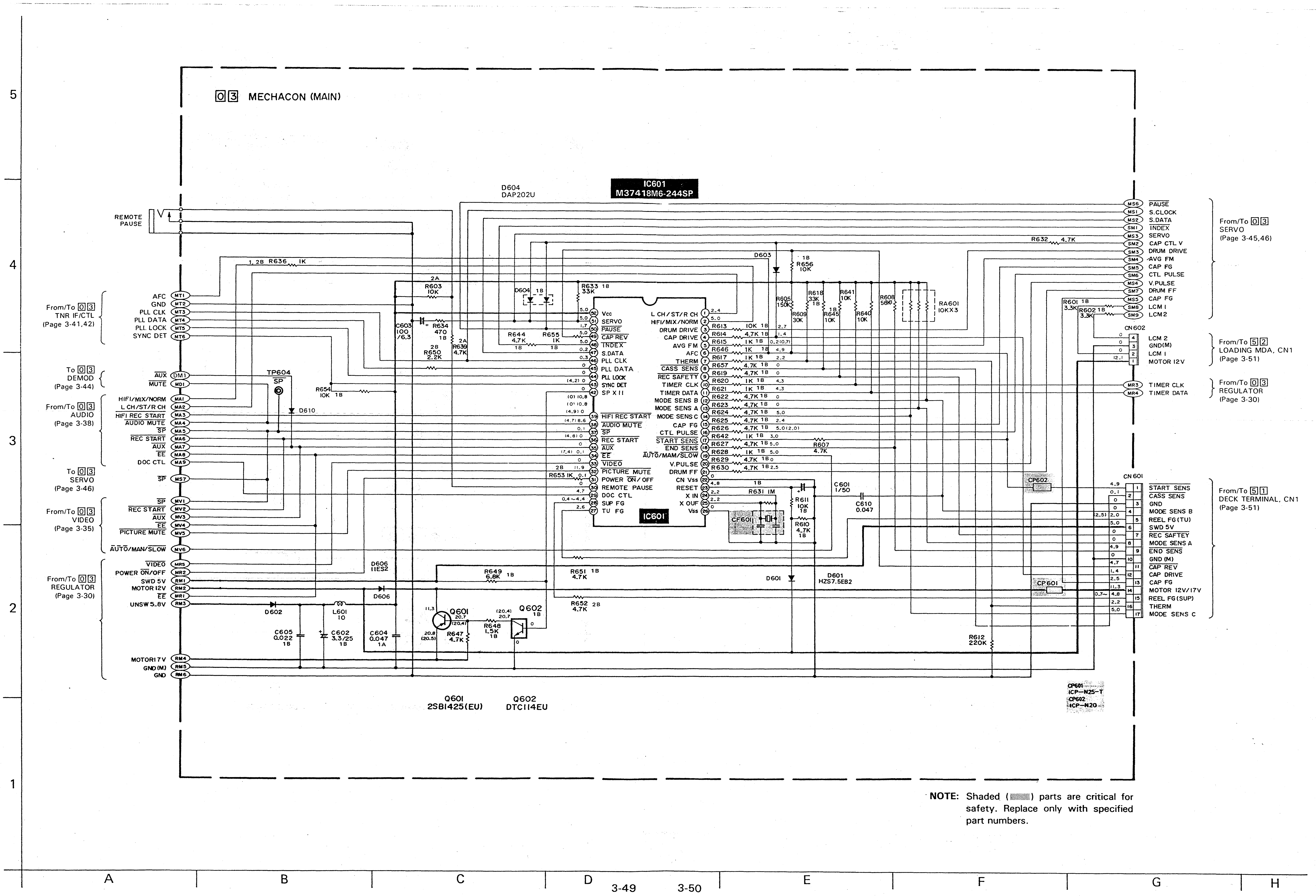


03 MAIN (SERVO)
IC401
HD49733NT
PB 5.1 Vp-p
5.0 Vp-p
3.0 Vp-p
0.7 Vp-p
5.0 Vp-p
PB 3.8 Vp-p
4.2 Vp-p
3.0 Vp-p
2.6 Vp-p
2.6 Vp-p
2.6 Vp-p
2.6 Vp-p
2.0 Vp-p
REC 6.0 Vp-p
REC 3.0 Vp-p
TP603
DRUM START
TP411
D. FF
TP401
CTL PULSE
CAP FG
S CLOCK
S DATA
From/To 03 MECHACON (Page 3-50)
COMP SYNC
3 Fsc
V PULSE
YNP PULSE
A FF
D FF
From/To 03 VIDEO (Page 3-35)
To 03 AUDIO (Page 3-38)
DRUM FF
From/To 03 MECHACON (Page 3-50)
INDEX
CTL CLOCK
To 03 REGULATOR (Page 3-30)
From 03 MECHACON (Page 3-50)
12 A/CTL HEAD
CN1
CN401
CTL
COUNT DOWN
COUNT DOWN
SERIAL DECODER
FUNCTION MODE
NTSC MODE
SYNC SEP
V. FM
CLK
REC/PB CTL GEN.
CTL INDEX DET
DRUM & V PULSE GEN.
DRUM START
SPCL PB
LCM 2
LCM 1
DRUM SEL A
DRUM SEL B
DIF AMP
DRUM F-V CONV
DRUM PHASE DET
DRUM CAP REF
CAP PHASE DET
CAP F-V CONV
CTL AMP
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
SW10
SW11
PB
REC
Vcc/2
DIF AMP
D403
D402
R419 82K
R406 1K
C410 0.001
C408 0.001
R405 1K
C406 0.001
R404 1K
Q401
R403 1M
R418 220K
R402 1K
C402 22/10
C403 22/10
R401 820
C401 0.001
C409 0.056
C407 4.7/50
R440 2.2M
C404 100P
R434 33K
R435 33K
R423 1M
C420 0.047
R422 8.2K
C421 1/50
R424 120K
R420 1M
R421 39K
R417 470K
R416 680K
D408
D407
R414 1M
R413 6.8K
R412 27K
R411 10K
C414 0.1
R407 82K
R408 1M
C415 0.0047
R409 100K
C413 22/10
R415 47K
C417 4.7/25
C419 10/16
C418 10/16
C416 4.7/25
C426 180P
C423 0.0068
C422 100P
R427 470K
R428 47K
R427 SP PB SW POINT
R426 10K
R425 1K
R410 2.2K
R429 100K
D411
D406
D412
D404
CP401
ICP-N15-T
Q401 2SA1576(QRS)
D404, D406 DAN202U
SPCL PB
LCM 2
LCM 1
V PULSE
To 03 VIDEO (Page 3-35)
From/To 03 MECHACON (Page 3-50)
GND
SWD 5V
GND (M)
MOTOR 12V
From 03 REGULATOR (Page 3-30)
CN402
MOTOR 12V
GND (M)
DRUM FG/PG
DRUM DRIVE
From/To 58 DRUM MOTOR
CN452
NC
GND
VIDEO FM
VIDEO FF
AUDIO FM
SP
V. FM
SWD 5V
AVG FM
NC
NC
From/To 83 AUTO TRACKING,CN451 (Page 3-47)
P B FM
From 03 VIDEO (Page 3-35)
PAUSE
CAP CTL V
SERVO
DRUM DRIVE
AVG FM
SP
From/To 03 MECHACON (Page 3-49,50)
AUDIO FM
From 03 AUDIO (Page 3-38)
1
2
3
4
5
A
B
C
D
E
F
G
H


8 3 AUTO TRACKING
From/To 0 3
MAIN (SERVO)
CN452
(Page3-46)
CN451
NC 1
GND 2 0
VIDEO FM 3 3.3
VIDEO FF 4 0
AUDIO FM 5 2.6
SP 6 0.2
VIDEO FM 7 5.2
SWD 5V 8 5.2
AVG FM 9 0.1
NC 10 0
NC 11 0
SWD 5V
R460 4.7K
R452 1K
R453 1K
R455 4.7K
R456 1K
C451 0.01
C454 0.1
C452 0.01
L451 27
R451 1K
C453 0.01
C455 0.01
IC451
BA7039
AMP
S/H
VCA
TIM
OUT
V/I
Vcc
GND
C457 0.01
R461 4.7K
C459 0.01
C458 22/10
C456 0.1
R458 120K
SWD 5V

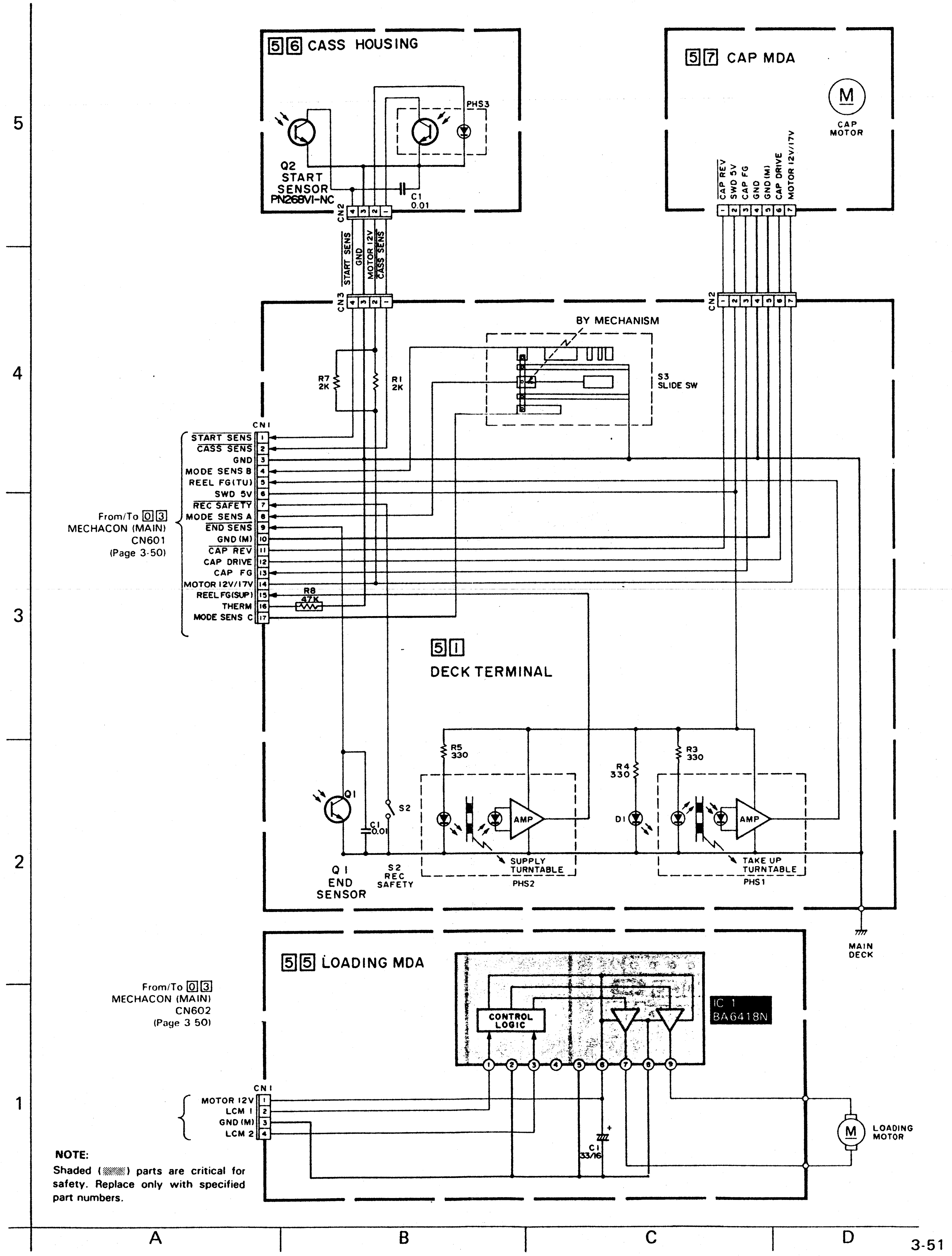

CN451
1
11
C456
C458
C459
C457
R458
16
B
9
8
IC451
1
C451
C455
C452
C453
R451
R456
R460
R455
L451
R453
R452
R461
C454
EI 437 V0
A
A
8 3
PB10380 A4
A.T PWB ASS'Y
PB10380
A.T PWB

3.25 SYSTEM CONTROL SCHEMATIC DIAGRAM


03 MECHACON (MAIN)
IC601
M37418M6-244SP
D604
DAP202U
REMOTE
PAUSE
From/To 03
TNR IF/CTL
(Page 3-41,42)
AFC MT1
GND MT2
PLL CLK MT3
PLL DATA MT4
PLL LOCK MT5
SYNC DET MT6
To 03
DEMOD
(Page 3-44)
AUX DM1
MUTE MD1
From/To 03
AUDIO
(Page 3-38)
HIFI/MIX/NORM MA1
L CH/ST/R CH MA2
HIFI REC START MA3
AUDIO MUTE MA4
SP MA5
REC START MA6
AUX MA7
EE MA8
DOC CTL MA9
To 03
SERVO
(Page 3-46)
SP MS7
From/To 03
VIDEO
(Page 3-35)
SP MV1
REC START MV2
AUX MV3
EE MV4
PICTURE MUTE MV5
AUTO/MAN/SLOW MV6
From/To 03
REGULATOR
(Page 3-30)
VIDEO MR5
POWER ON/OFF MR2
SWD 5V RM1
MOTOR 12V RM2
EE MR1
UNSW 5.8V RM3
MOTOR17V RM4
GND(M) RM5
GND RM6
TP604
SP
D610
R636 1K
R603 10K
R654 10K
C603 100 /6.3
R634 470
R650 2.2K
R639 4.7K
R644 4.7K
R655 1K
R633 33K
D606 11ES2
D602
L601 10
C605 0.022
C602 3.3/25
C604 0.047
Q601
Q602
R647 4.7K
R648 1.5K
R649 6.8K
R651 4.7K
R652 4.7K
R653 1K
Q601 2SB1425(EU)
Q602 DTC114EU
Vcc
SERVO
PAUSE
CAP REV
INDEX
S.DATA
PLL CLK
PLL DATA
PLL LOCK
SYNC DET
SP X11
HIFI REC START
AUDIO MUTE
SP
REC START
AUX
EE
VIDEO
PICTURE MUTE
POWER ON/OFF
REMOTE PAUSE
DOC CTL
SUP FG
TU FG
L CH/ST/R CH
HIFI/MIX/NORM
DRUM DRIVE
CAP DRIVE
AVG FM
AFC
THERM
CASS SENS
REC SAFETY
TIMER CLK
TIMER DATA
MODE SENS B
MODE SENS A
MODE SENS C
CAP FG
CTL PULSE
START SENS
END SENS
AUTO/MAN/SLOW
V.PULSE
DRUM FF
CN Vss
RESET
X IN
X OUT
Vss
R613 10K
R614 4.7K
R615 1K
R646 1K
R617 1K
R657 4.7K
R619 4.7K
R620 1K
R621 1K
R622 4.7K
R623 4.7K
R624 4.7K
R625 4.7K
R626 4.7K
R642 1K
R627 4.7K
R628 1K
R629 4.7K
R630 4.7K
R631 1M
R607 4.7K
R611 10K
R610 4.7K
CF601
C601 1/50
C610 0.047
D603
R656 10K
R605 150K
R609 30K
R618 33K
R645 10K
R641 10K
R640 10K
R608 56K
RA601 10KX3
R632 4.7K
R601 3.3K
R602 3.3K
D601 HZS7.5EB2
R612 220K
CP601
CP602
PAUSE MS6
S.CLOCK MS1
S.DATA MS2
INDEX SM1
SERVO MS3
CAP CTL V SM2
DRUM DRIVE SM3
AVG FM SM4
CAP FG SM5
CTL PULSE SM6
V.PULSE MS4
DRUM FF SM7
CAP FG MS5
LCM 1 SM8
LCM 2 SM9
From/To 03
SERVO
(Page 3-45,46)
CN602
LCM 2
GND(M)
LCM 1
MOTOR 12V
From/To 52
LOADING MDA, CN1
(Page 3-51)
TIMER CLK MR3
TIMER DATA MR4
From/To 03
REGULATOR
(Page 3-30)
CN601
START SENS
CASS SENS
GND
MODE SENS B
REEL FG(TU)
SWD 5V
REC SAFTEY
MODE SENS A
END SENS
GND (M)
CAP REV
CAP DRIVE
CAP FG
MOTOR 12V/17V
REEL FG(SUP)
THERM
MODE SENS C
From/To 51
DECK TERMINAL, CN1
(Page 3-51)
CP601 ICP-N25-T
CP602 ICP-N20
A
B
C
D
E
F
G
H
1
2
3
4
5

NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

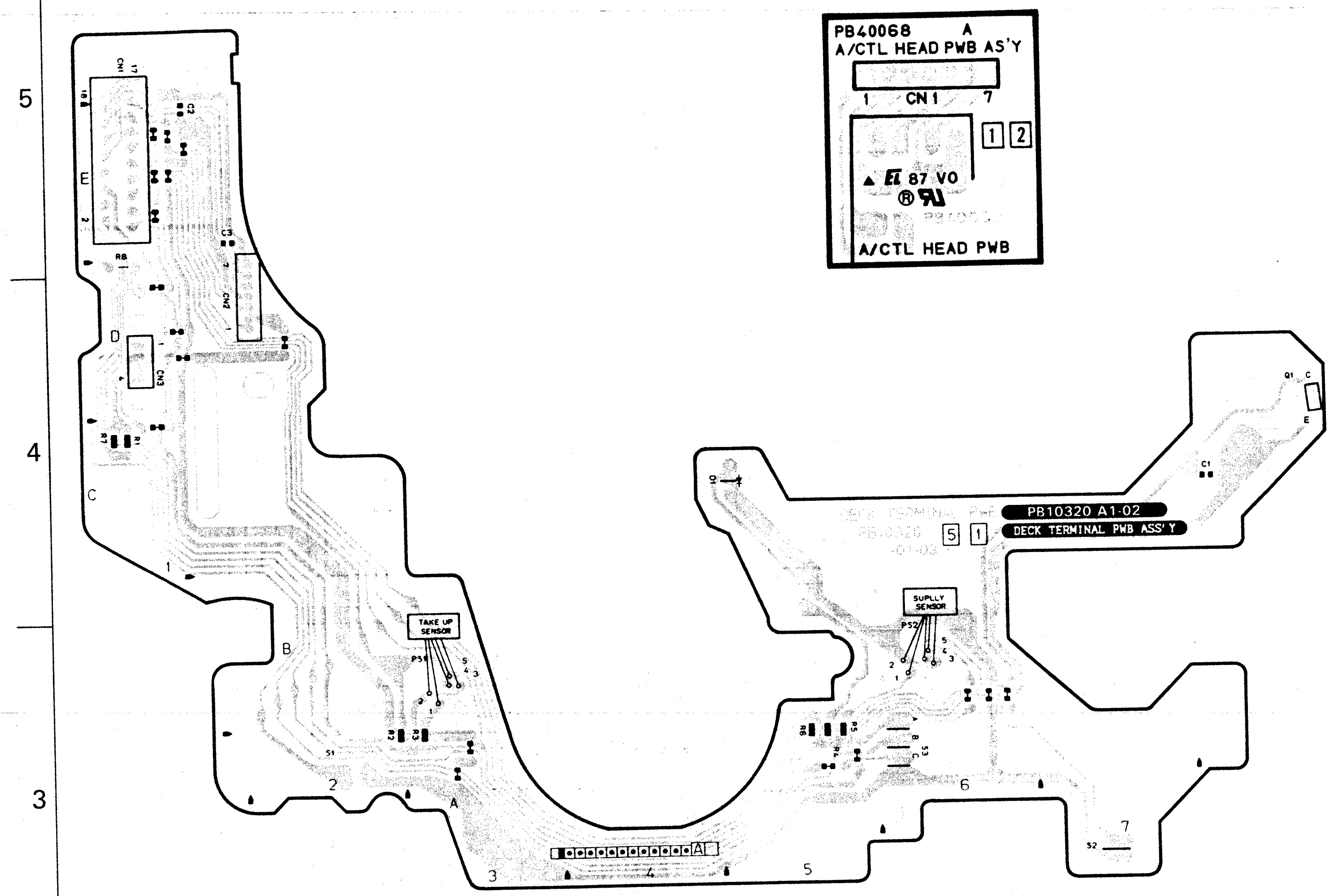
3.26 DECK TERMINAL, LOADING MDA, CASS. HOUSING AND CAPSTAN MDA SCHEMATIC DIAGRAMS


5
4
3
2
1
A
B
C
D
56 CASS HOUSING
PHS3
Q2
START
SENSOR
PN268VI-NC
C1
0.01
CN2
START SENS
GND
MOTOR 12V
CASS SENS
CN3
57 CAP MDA
M
CAP
MOTOR
CAP REV
SWD 5V
CAP FG
GND
GND (M)
CAP DRIVE
MOTOR 12V/17V
CN2
BY MECHANISM
S3
SLIDE SW
R7
2K
R1
2K
CN1
START SENS
CASS SENS
GND
MODE SENS B
REEL FG(TU)
SWD 5V
REC SAFETY
MODE SENS A
END SENS
GND (M)
CAP REV
CAP DRIVE
CAP FG
MOTOR 12V/17V
REEL FG(SUP)
THERM
MODE SENS C
From/To 03
MECHACON (MAIN)
CN601
(Page 3-50)
R8
47K
51
DECK TERMINAL
R5
330
R4
330
R3
330
Q1
C1
0.01
S2
AMP
D1
AMP
SUPPLY
TURNTABLE
PHS2
TAKE UP
TURNTABLE
PHS1
Q1
END
SENSOR
S2
REC
SAFETY
MAIN
DECK
55 LOADING MDA
CONTROL
LOGIC
IC 1
BA6418N
From/To 03
MECHACON (MAIN)
CN602
(Page 3 50)
CN1
MOTOR 12V
LCM 1
GND (M)
LCM 2
C1
33/16
M
LOADING
MOTOR

NOTE:
Shaded (▨) parts are critical for safety. Replace only with specified part numbers.

3.27 DECK TERMINAL, LOADING MDA, A/CTL HEAD AND CASS. HOUSING CIRCUIT BOARDS

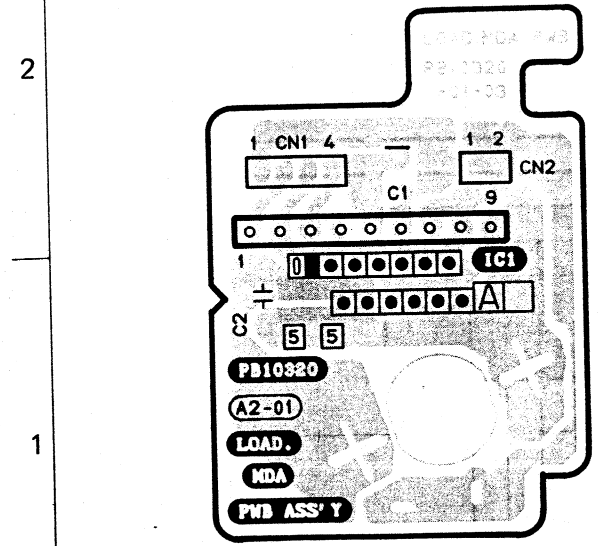
– DECK TERMINAL –


5
4
3
CN1
R8
D
C
B
A
1
2
3
4
5
6
7
CN2
Q1
C1
E
PB10320 A1-02
DECK TERMINAL PWB ASS'Y
51
TAKE UP SENSOR
SUPLLY SENSOR
PS1
PS2
S1
S2

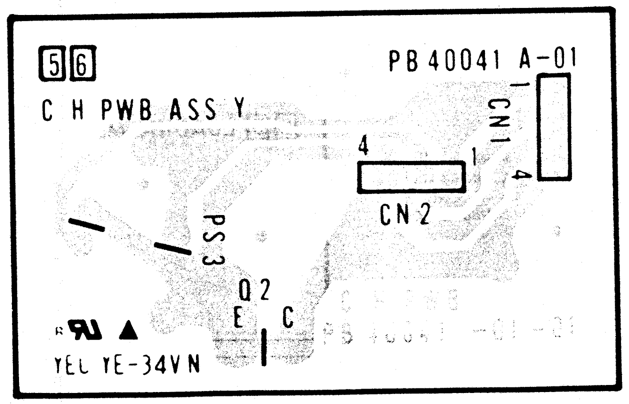
– A/CTL HEAD –

PB40068 A
A/CTL HEAD PWB AS'Y
1 CN1 7
12
87 V0
A/CTL HEAD PWB

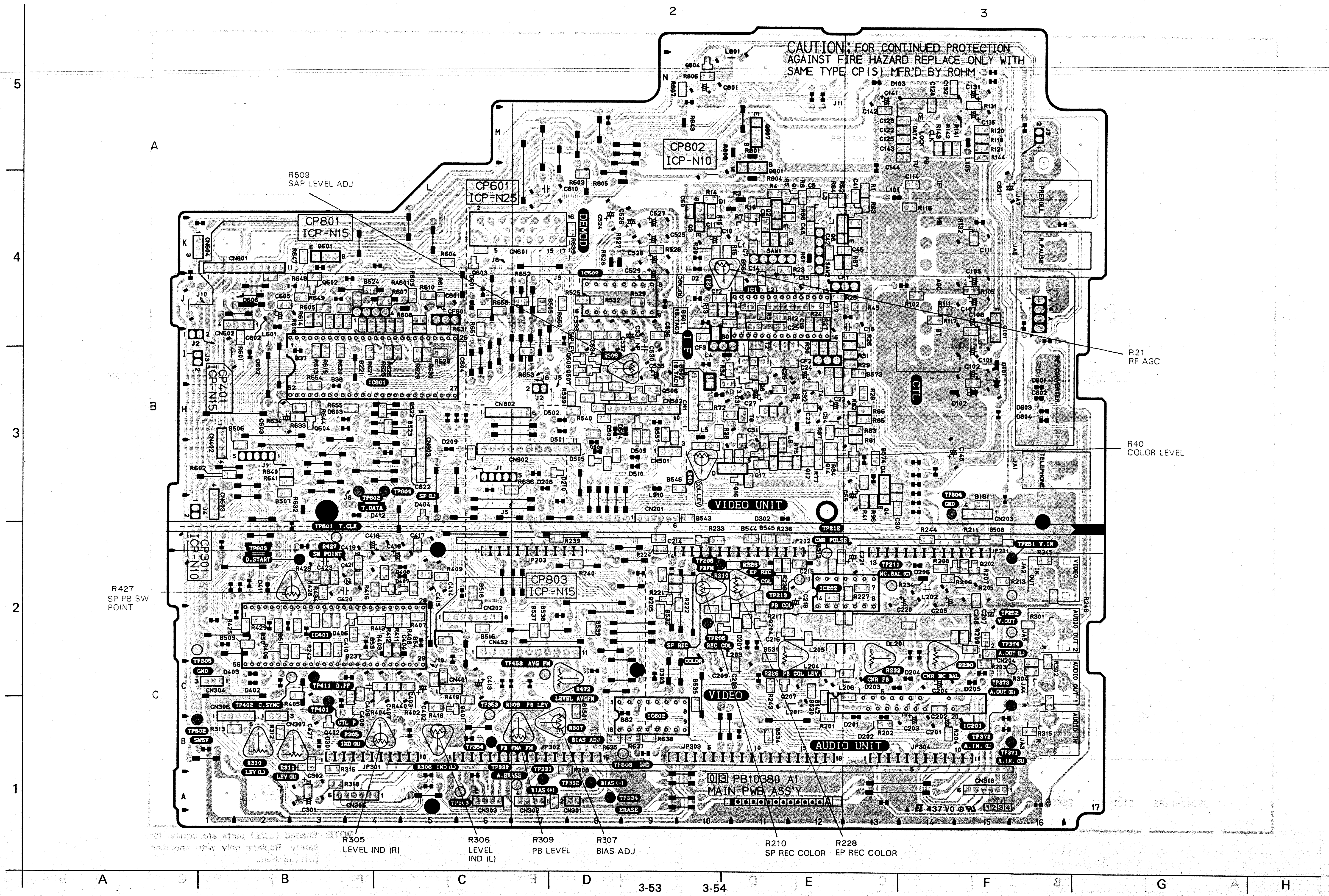
– LOADING MDA –


2
1
1 CN1 4
1 2
CN2
C1
9
1
IC1
A
C2
55
PB10320
A2-01
LOAD.
MDA
PWB ASS'Y

– CASSETTE HOUSING –

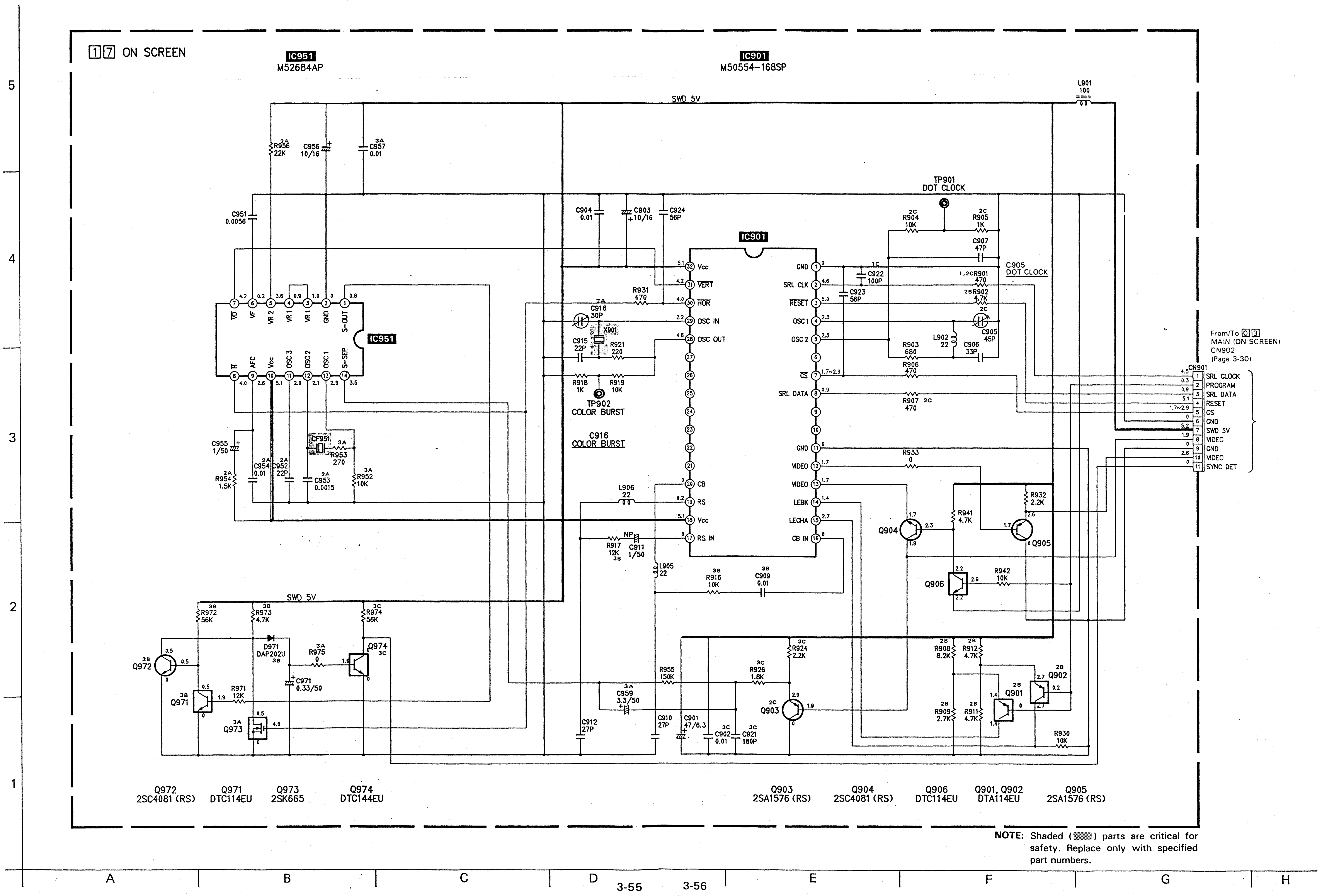

56
PB 40041 A-01
C H PWB ASS Y
CN1
1
4
4
1
CN 2
PS 3
Q 2
E C
YEL YE-34VN

3.28 MAIN CIRCUIT BOARD



CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD REPLACE ONLY WITH SAME TYPE CP(S) MFR'D BY ROHM
CP802 ICP-N10
CP601 ICP-N25
CP801 ICP-N15
CP401 ICP-N15
CP301 ICP-N10
CP803 ICP-N15
DEMOD
IF
CTL
VIDEO UNIT
VIDEO
AUDIO UNIT
PB10380 A1
MAIN PWB ASS'Y
R509
SAP LEVEL ADJ
R21
RF AGC
R40
COLOR LEVEL
R427
SP PB SW POINT
R305
LEVEL IND (R)
R306
LEVEL IND (L)
R309
PB LEVEL
R307
BIAS ADJ
R210
SP REC COLOR
R228
EP REC COLOR
1
2
3
4
5
A
B
C
D
E
F
G
H

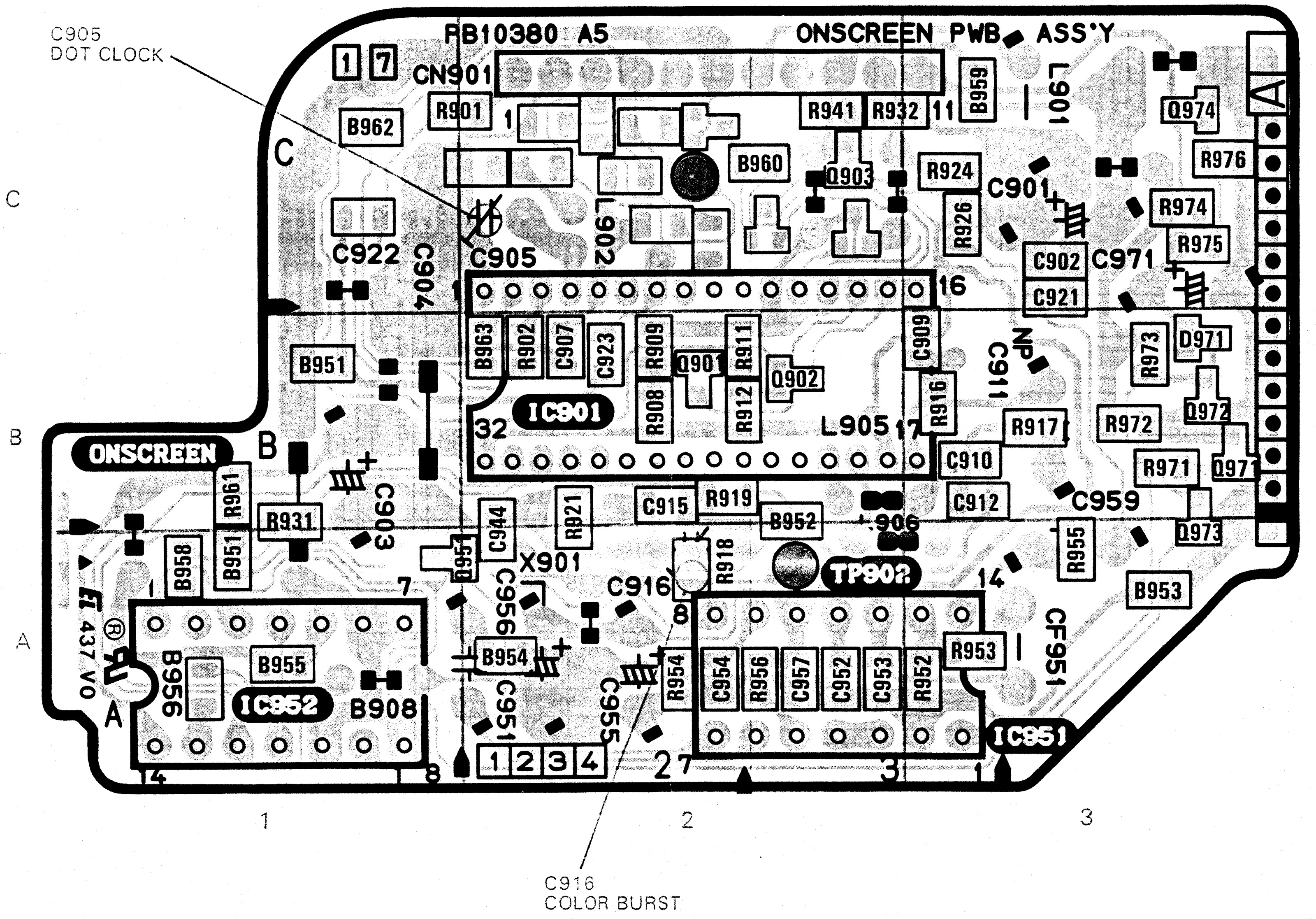
3.29 ON SCREEN SCHEMATIC DIAGRAM



1 7 ON SCREEN
IC951
M52684AP
IC901
M50554–168SP
SWD 5V
L901
100
R956
22K
C956
10/16
C957
0.01
C951
0.0056
VD
VF
VR 2
VR 1
VR 1
GND
S-OUT
FH
AFC
Vcc
OSC 3
OSC 2
OSC 1
S-SEP
C955
1/50
R954
1.5K
C954
0.01
C952
22P
CF951
R953
270
C953
0.0015
R952
10K
C904
0.01
C903
10/16
C924
56P
R931
470
C916
30P
X901
C915
22P
R921
220
R918
1K
R919
10K
TP902
COLOR BURST
C916
COLOR BURST
Vcc
VERT
HOR
OSC IN
OSC OUT
CB
RS
Vcc
RS IN
GND
SRL CLK
RESET
OSC 1
OSC 2
CS
SRL DATA
GND
VIDEO
VIDEO
LEBK
LECHA
CB IN
L906
22
R917
12K
C911
1/50
NP
L905
22
R916
10K
C909
0.01
TP901
DOT CLOCK
R904
10K
R905
1K
C907
47P
C922
100P
C923
56P
C905
DOT CLOCK
R901
470
R902
4.7K
C905
45P
L902
22
C906
33P
R903
680
R906
470
R907
470
R933
0
R932
2.2K
R941
4.7K
Q904
Q905
Q906
R942
10K
From/To 03
MAIN (ON SCREEN)
CN902
(Page 3-30)
CN901
SRL CLOCK
PROGRAM
SRL DATA
RESET
CS
GND
SWD 5V
VIDEO
GND
VIDEO
SYNC DET
R972
56K
R973
4.7K
R974
56K
Q972
D971
DAP202U
R975
0
Q974
Q971
R971
12K
C971
0.33/50
Q973
C959
3.3/50
R955
150K
R926
1.8K
R924
2.2K
Q903
C912
27P
C910
27P
C901
47/6.3
C902
0.01
C921
180P
R908
8.2K
R912
4.7K
R909
2.7K
R911
4.7K
Q901
Q902
R930
10K
Q972
2SC4081 (RS)
Q971
DTC114EU
Q973
2SK665
Q974
DTC144EU
Q903
2SA1576 (RS)
Q904
2SC4081 (RS)
Q906
DTC114EU
Q901, Q902
DTA114EU
Q905
2SA1576 (RS)
5
4
3
2
1
A
B
C
D
E
F
G
H

NOTE: Shaded (▒) parts are critical for safety. Replace only with specified part numbers.

3.30 ON SCREEN CIRCUIT BOARD


C905
DOT CLOCK

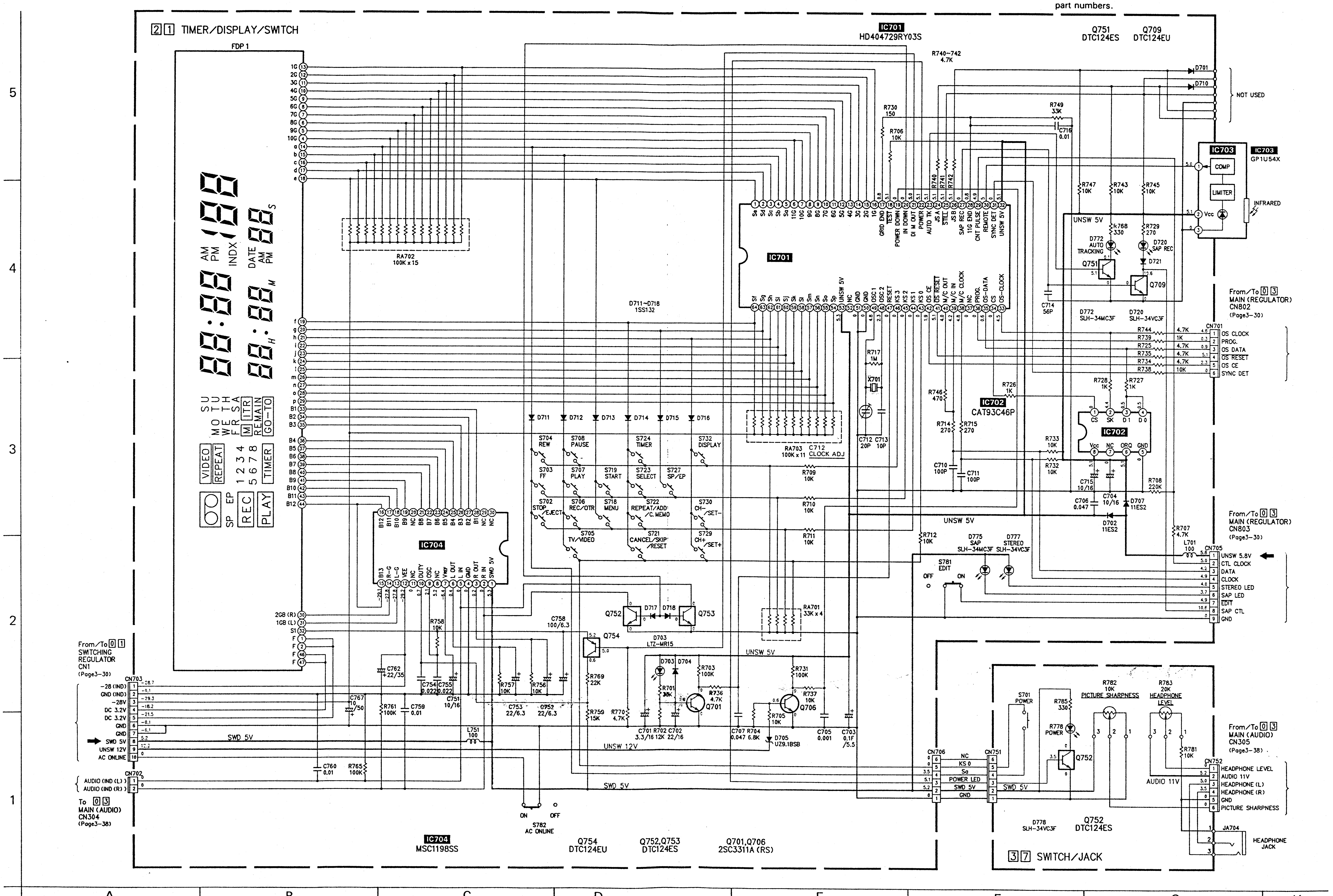
C916
COLOR BURST

PB10380 A5
ONSCREEN PWB ASS'Y
CN901
1
7
11
R901
B962
R941
R932
B959
L901
Q974
R976
B960
Q903
R924
C901
R974
R926
R975
C922
C904
C905
L902
C902
C971
C921
16
B951
B963
R902
C907
C923
R909
Q901
R911
Q902
C909
NP
C911
R973
D971
IC901
R908
R912
L905
17
R916
R917
R972
D972
32
C910
R971
Q971
ONSCREEN
R961
R931
C903
C944
R921
C915
R919
B952
906
C912
C959
D973
R955
B958
B951
D951
X901
C916
R918
TP902
14
B953
C956
8
CF951
B956
B955
B954
R954
C954
R956
C957
C952
C953
R952
R953
IC952
B908
C951
C955
IC951
1
2
3
4
2
7
3
1
14
8
A
B
C
437 V0

5
4
3
2
1
A
B
C
D
E
F
G
H

3.31 TIMER/DISPLAY/SWITCH AND SWITCH/JACK SCHEMATIC DIAGRAMS

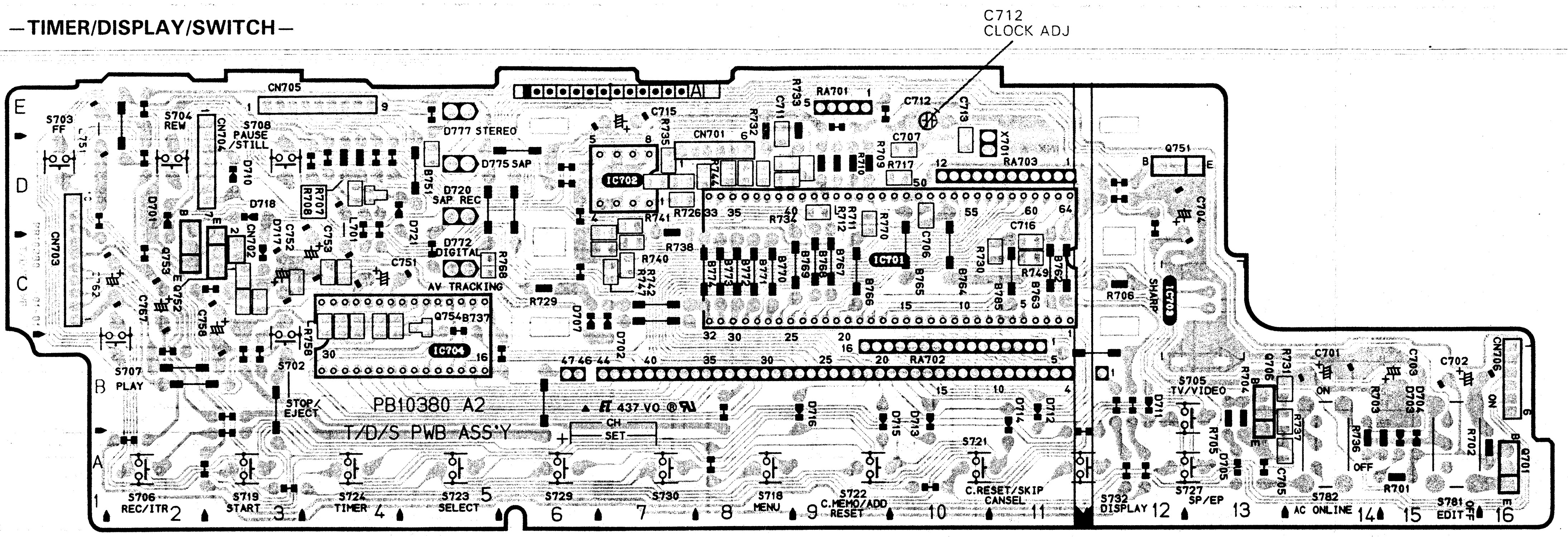
NOTE: Shaded (▨) parts are critical for safety. Replace only with specified part numbers.



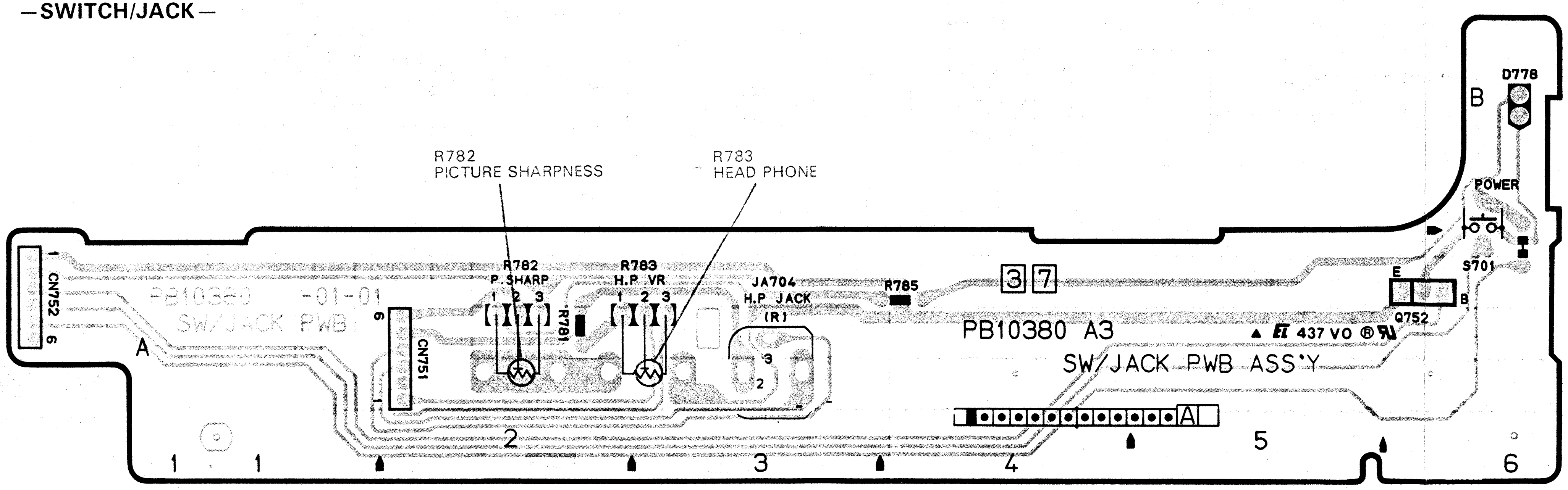
2 1 TIMER/DISPLAY/SWITCH
FDP 1
IC701
HD404729RY03S
IC702
CAT93C46P
IC703
GP1U54X
IC704
MSC1198SS
Q751 DTC124ES
Q709 DTC124EU
Q754 DTC124EU
Q752,Q753 DTC124ES
Q701,Q706 2SC3311A (RS)
R740~742 4.7K
RA702 100K x 15
RA703 100K x 11
RA701 33K x 4
D711~D718 1SS132
NOT USED
INFRARED
COMP
LIMITER
C712 CLOCK ADJ
D772 AUTO TRACKING
D720 SAP REC
D772 SLH-34MC3F
D720 SLH-34VC3F
D775 SAP SLH-34MC3F
D777 STEREO SLH-34VC3F
D703 LTZ-MR15
D705 UZ9.1BSB
S704 REW
S708 PAUSE
S724 TIMER
S732 DISPLAY
S703 FF
S707 PLAY
S719 START
S723 SELECT
S727 SP/EP
S702 STOP/EJECT
S706 REC/OTR
S718 MENU
S722 REPEAT/ADD/C.MEMO
S730 CH-/SET-
S705 TV/VIDEO
S721 CANCEL/SKIP/RESET
S729 CH+/SET+
S781 EDIT
OFF
ON
S782 AC ONLINE
UNSW 5V
UNSW 12V
SWD 5V
From/To 0 3 MAIN (REGULATOR) CN802 (Page3-30)
CN701
OS CLOCK
PROG.
OS DATA
OS RESET
OS CE
SYNC DET
From/To 0 3 MAIN (REGULATOR) CN803 (Page3-30)
CN705
UNSW 5.8V
CTL CLOCK
DATA
CLOCK
STEREO LED
SAP LED
EDIT
SAP CTL
GND
From/To 0 1 SWITCHING REGULATOR CN1 (Page3-30)
CN703
-28 (IND)
GND (IND)
-28V
DC 3.2V
DC 3.2V
GND
GND
SWD 5V
UNSW 12V
AC ONLINE
CN702
AUDIO (IND (L))
AUDIO (IND (R))
To 0 3 MAIN (AUDIO) CN304 (Page3-38)
CN706
CN751
NC
KS 0
So
POWER LED
SWD 5V
GND
3 7 SWITCH/JACK
S701 POWER
R778 POWER
R782 10K PICTURE SHARPNESS
R783 20K HEADPHONE LEVEL
Q752 DTC124ES
D778 SLH-34VC3F
AUDIO 11V
From/To 0 3 MAIN (AUDIO) CN305 (Page3-38)
CN752
HEADPHONE LEVEL
AUDIO 11V
HEADPHONE (L)
HEADPHONE (R)
GND
PICTURE SHARPNESS
JA704
HEADPHONE JACK
A
B
C
D
E
F
G
H
1
2
3
4
5

3.32 TIMER/DISPLAY/SWITCH, AND SWITCH/JACK CIRCUIT BOARD

—TIMER/DISPLAY/SWITCH—


C712
CLOCK ADJ
CN705
S703 FF
S704 REW
S708 PAUSE /STILL
CN704
CN703
CN702
D777 STEREO
D775 SAP
D720 SAP REC
D772 DIGITAL
AV TRACKING
IC702
IC701
IC704
IC703
CN701
RA701
RA702
RA703
X701
Q751
Q752
Q753
Q754
S707 PLAY
S702 STOP/ EJECT
PB10380 A2
T/D/S PWB ASS'Y
CH SET
437 VO
S706 REC/ITR
S719 START
S724 TIMER
S723 SELECT
S729
S730
S718 MENU
S722 C.MEMO/ADD RESET
S721 C.RESET/SKIP CANSEL
S732 DISPLAY
S705 TV/VIDEO
S727 SP/EP
AC ONLINE
S782
S781 EDIT
SHARP
ON
OFF
CN706
Q701
Q705
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
A
B
C
D
E

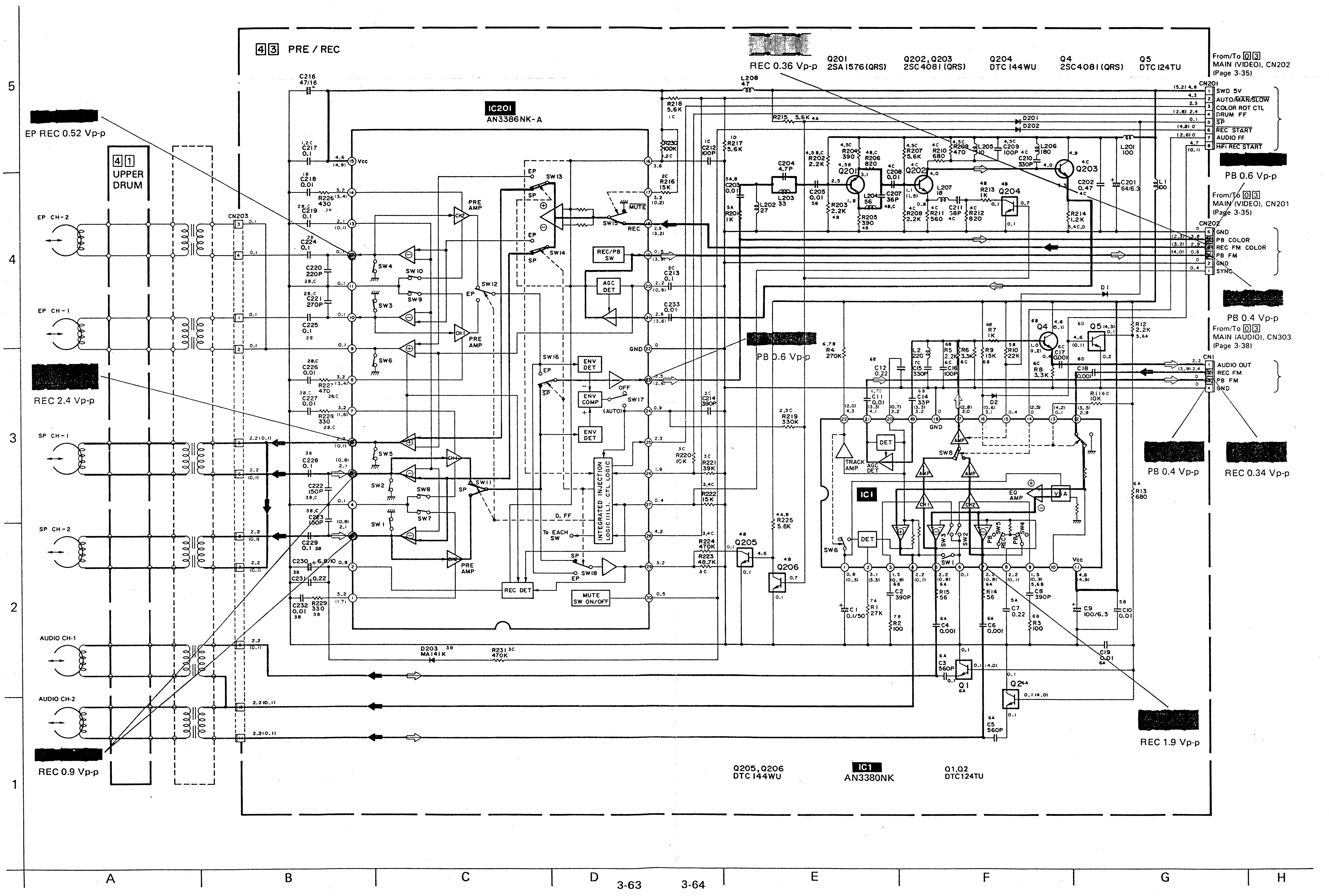
—SWITCH/JACK—


R782
PICTURE SHARPNESS
R783
HEAD PHONE
CN752
PB10380 -01-01
SW/JACK PWB
CN751
R782 P.SHARP
R783 H.P VR
R781
JA704 H.P JACK (R)
R785
37
PB10380 A3
437 VO
SW/JACK PWB ASS'Y
Q752
S701
POWER
D778
A
B
1
2
3
4
5
6

5
4
3
2
1

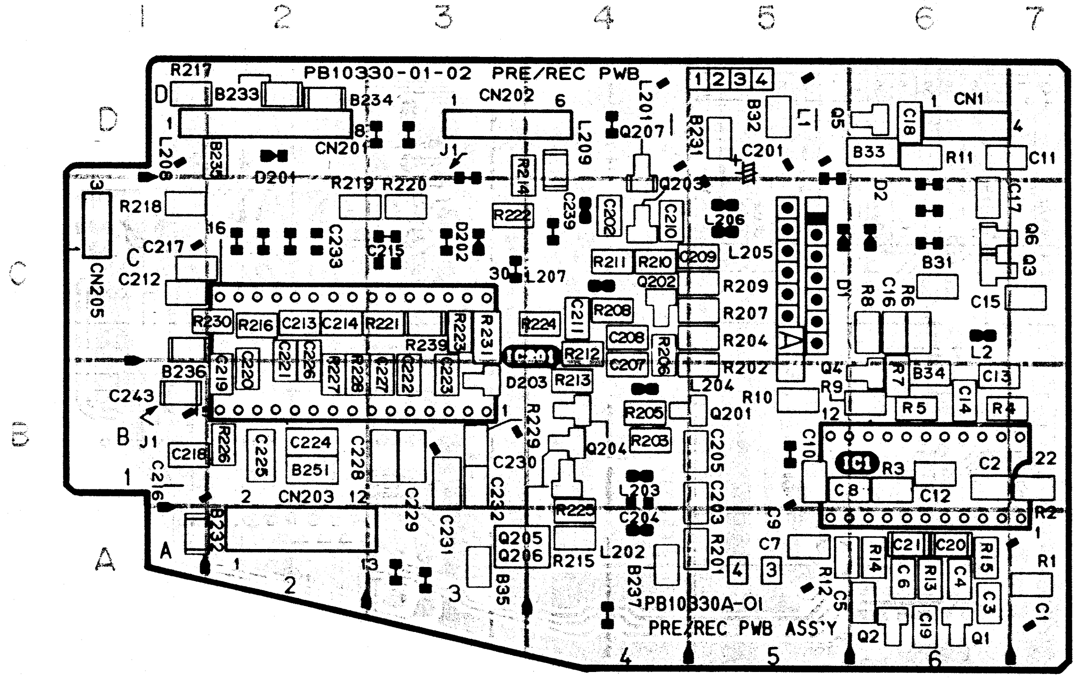
A B C D E F G H

3.33 PRE/REC SCHEMATIC DIAGRAM

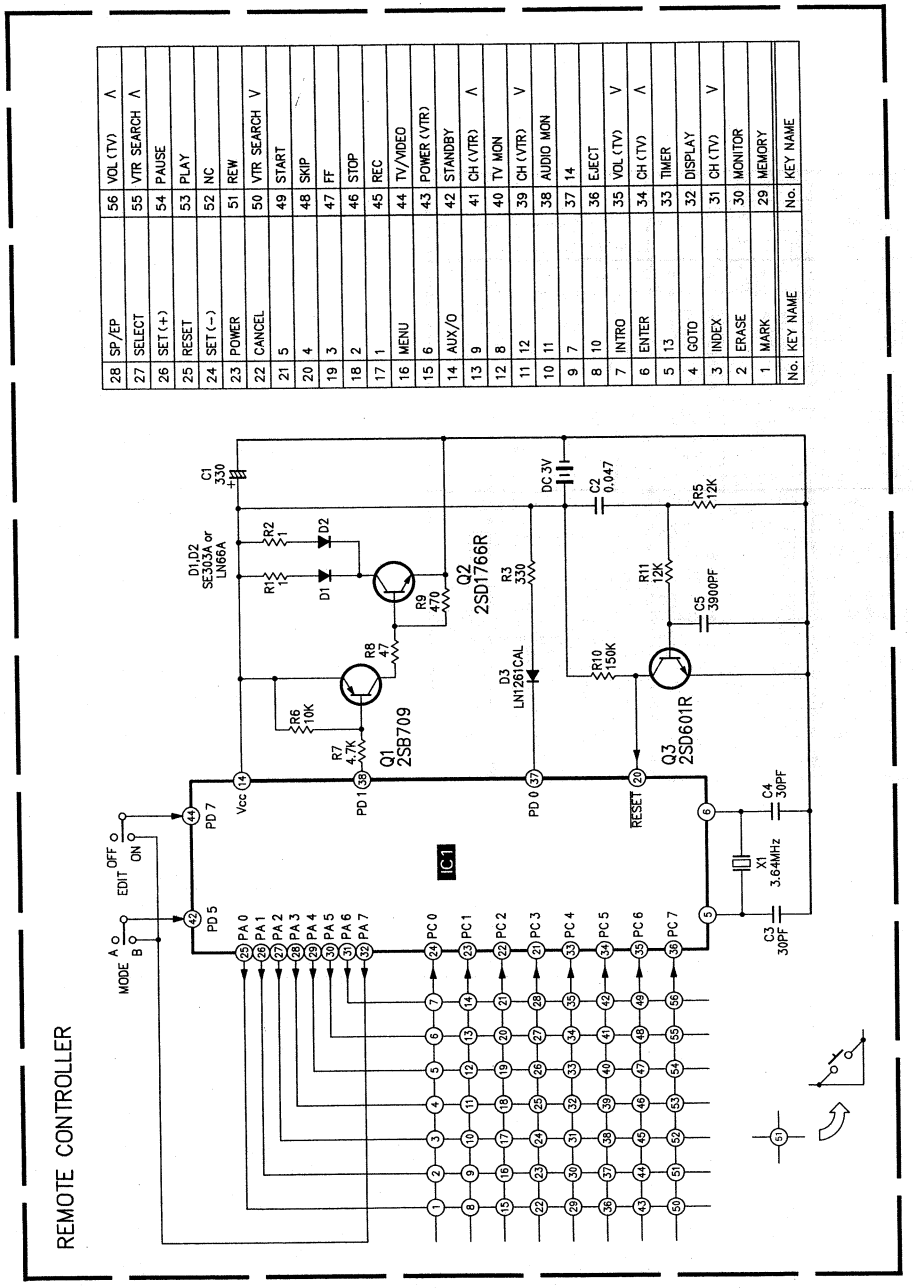


4 3 PRE / REC
4 1 UPPER DRUM
IC201 AN3386NK-A
IC1 AN3380NK
EP REC 0.52 Vp-p
REC 2.4 Vp-p
REC 0.9 Vp-p
REC 0.36 Vp-p
PB 0.6 Vp-p
PB 0.4 Vp-p
REC 0.34 Vp-p
REC 1.9 Vp-p
EP CH-2
EP CH-1
SP CH-1
SP CH-2
AUDIO CH-1
AUDIO CH-2
CN203
Q201 2SA1576(QRS)
Q202,Q203 2SC4081(QRS)
Q204 DTC144WU
Q4 2SC4081(QRS)
Q5 DTC124TU
Q205,Q206 DTC144WU
Q1,Q2 DTC124TU
From/To 0 3 MAIN (VIDEO), CN202 (Page 3-35)
CN201
SWD 5V
AUTO/MAN/SLOW
COLOR ROT CTL
DRUM FF
SP
REC START
AUDIO FF
HiFi REC START
From/To 0 3 MAIN (VIDEO), CN201 (Page 3-35)
CN202
GND
PB COLOR
REC FM COLOR
PB FM
GND
SYNC
From/To 0 3 MAIN (AUDIO), CN303 (Page 3-38)
CN1
AUDIO OUT
REC FM
PB FM
GND
PRE AMP
MUTE
REC/PB SW
AGC DET
ENV DET
ENV COMP
INTEGRATED INJECTION LOGIC(I²L) CTL LOGIC
REC DET
MUTE SW ON/OFF
To EACH SW
D. FF
TRACK AMP
AGC DET
DET
EQ AMP
VSA
D201
D202
D203 MA141K
1
2
3
4
5
A
B
C
D
E
F
G
H

3.34 PRE/REC CIRCUIT BOARD


PB10330-01-02 PRE/REC PWB
PB10330A-01
PRE/REC PWB ASS'Y
CN1
CN201
CN202
CN203
CN205
IC1
IC201
Q1
Q2
Q3
Q4
Q5
Q6
Q201
Q202
Q203
Q204
Q205
Q206
Q207
D2
D201
D202
D203
L1
L2
L201
L202
L203
L204
L205
L206
L207
L208
L209
J1
1
2
3
4
5
6
7
A
B
C
D

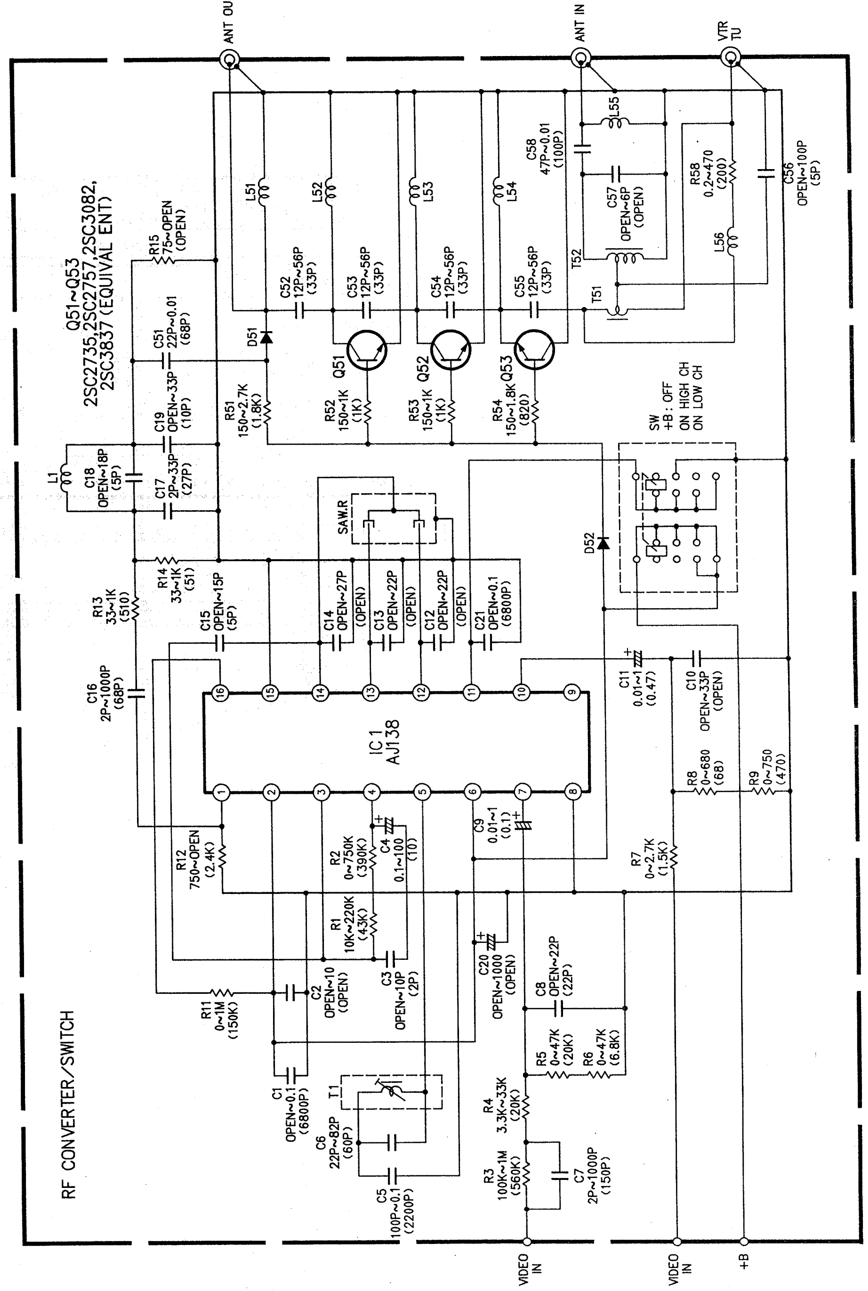
3.35 REMOTE CONTROL SCHEMATIC DIAGRAM


REMOTE CONTROLLER
IC1
C1 330
C2 0.047
DC 3V
R5 12K
R2 1
R1 1
D1
D2
D1,D2 SE303A or LN66A
Q2 2SD1766R
R9 470
R3 330
R11 12K
C5 3900PF
R8 47
Q1 2SB709
R6 10K
R7 4.7K
D3 LN1261CAL
R10 150K
Q3 2SD601R
Vcc
PD 1
PD 0
RESET
PD 7
PD 5
C4 30PF
X1 3.64MHz
C3 30PF
EDIT
OFF
ON
MODE
A
B
PA 0
PA 1
PA 2
PA 3
PA 4
PA 5
PA 6
PA 7
PC 0
PC 1
PC 2
PC 3
PC 4
PC 5
PC 6
PC 7

No.	KEY NAME	No.	KEY NAME
28	SP/EP	56	VOL (TV) ∧
27	SELECT	55	VTR SEARCH ∧
26	SET (+)	54	PAUSE
25	RESET	53	PLAY
24	SET (−)	52	NC
23	POWER	51	REW
22	CANCEL	50	VTR SEARCH ∨
21	5	49	START
20	4	48	SKIP
19	3	47	FF
18	2	46	STOP
17	1	45	REC
16	MENU	44	TV/VIDEO
15	6	43	POWER (VTR)
14	AUX/O	42	STANDBY
13	9	41	CH (VTR) ∧
12	8	40	TV MON
11	12	39	CH (VTR) ∨
10	11	38	AUDIO MON
9	7	37	14
8	10	36	EJECT
7	INTRO	35	VOL (TV) ∨
6	ENTER	34	CH (TV) ∧
5	13	33	TIMER
4	GOTO	32	DISPLAY
3	INDEX	31	CH (TV) ∨
2	ERASE	30	MONITOR
1	MARK	29	MEMORY

3.36 RF CONVERTER/SWITCH SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.

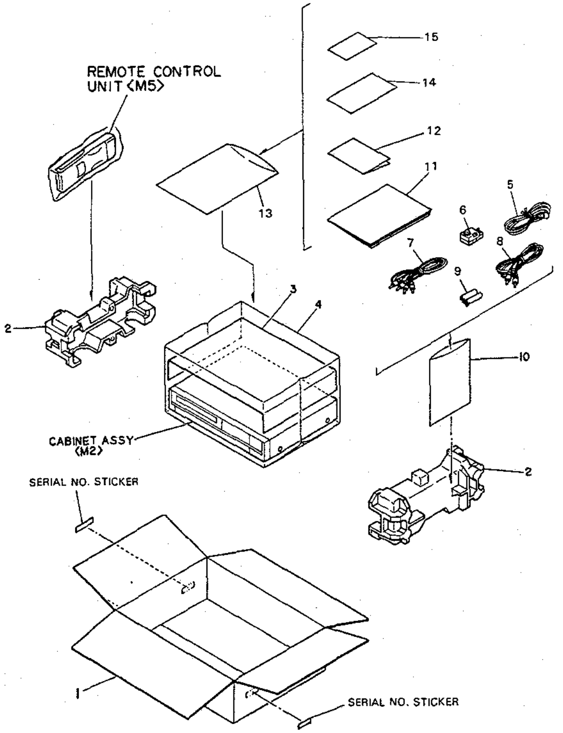

RF CONVERTER/SWITCH
ANT OUT
ANT IN
VTR TU
Q51~Q53 2SC2735,2SC2757,2SC3082, 2SC3837 (EQUIVAL ENT)
R15 75~OPEN (OPEN)
L51
L52
L53
L54
L55
L56
C58 47P~0.01 (100P)
C57 OPEN~6P (OPEN)
R58 0.2~470 (200)
C56 OPEN~100P (5P)
T52
T51
C52 12P~56P (33P)
C53 12P~56P (33P)
C54 12P~56P (33P)
C55 12P~56P (33P)
C51 22P~0.01 (68P)
D51
Q51
Q52
Q53
R51 150~2.7K (1.8K)
R52 150~1K (1K)
R53 150~1K (1K)
R54 150~1.8K (820)
SW +B: OFF ON HIGH CH ON LOW CH
C19 OPEN~33P (10P)
L1
C18 OPEN~18P (5P)
C17 2P~33P (27P)
SAW.R
D52
R13 33~1K (510)
R14 33~1K (51)
C15 OPEN~15P (5P)
C14 OPEN~27P (OPEN)
C13 OPEN~22P (OPEN)
C12 OPEN~22P (OPEN)
C21 OPEN~0.1 (6800P)
C16 2P~1000P (68P)
C11 0.01~1 (0.47)
C10 OPEN~33P (OPEN)
IC1 AJ138
R8 0~680 (68)
R9 0~750 (470)
R12 750~OPEN (2.4K)
R2 0~750K (390K)
C4 0.1~100 (10)
C9 0.01~1 (0.1)
R7 0~2.7K (1.5K)
R1 10K~220K (43K)
C3 OPEN~10P (2P)
C20 OPEN~1000 (OPEN)
C8 OPEN~22P (22P)
R11 0~1M (150K)
C2 OPEN~10 (OPEN)
R5 0~47K (20K)
R6 0~47K (6.8K)
C1 OPEN~0.1 (6800P)
T1
R4 3.3K~33K (20K)
C6 22P~82P (60P)
R3 100K~1M (560K)
C7 2P~1000P (150P)
C5 100P~0.1 (2200P)
VIDEO IN
VIDEO IN
+B

SECTION 4
EXPLODED VIEWS AND PARTS LIST

4.1 PACKING ASSEMBLY <M1>

SAFETY PRECAUTION
Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

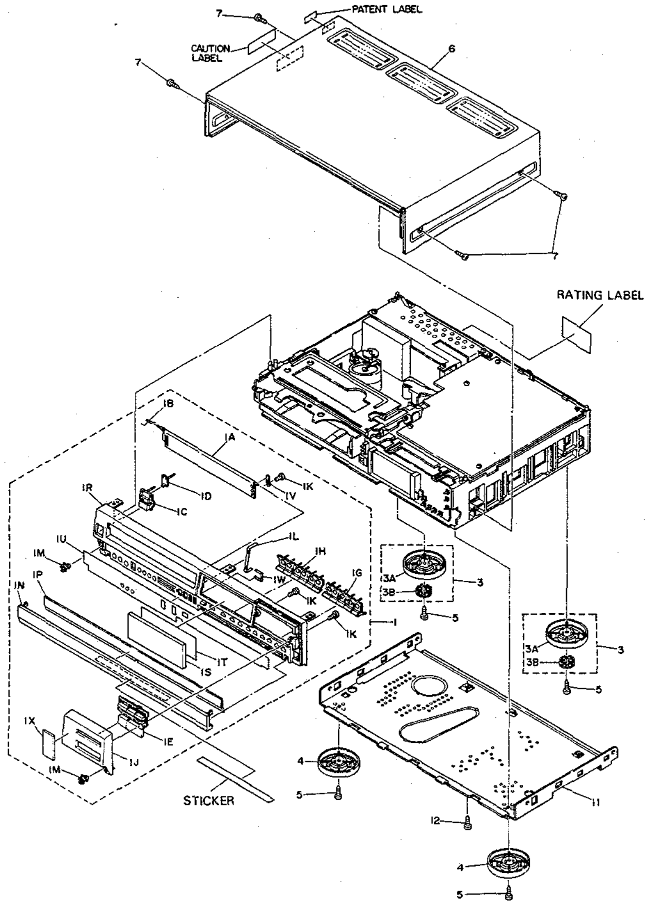
NOTE: <M > indicates mechanical symbol number.



PACKING ASSEMBLY <M1>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ33184-9	PACKING CASE,USA
		PQ33184-13	PACKING CASE,CANADA
	2	PQ33096A-2	CUSHION ASSY
	3	PQ41026-24	PROTECT SHEET
	4	PQM30021-59-11	POLY BAG
	5	PU59168-2	RF CABLE
		or PU59167-2	RF CABLE
⚠	6	PU35613-2	MATCHING TRANSFORMER
⚠		or PU59135-2	MATCHING TRANSFORMER
	7	PU56142-3	PIN CORD ASSY
		or PU56142-5	PIN CORD ASSY
	8	PU59205-3	PIN JACK CABLE
		or PU59205-4	PIN JACK CABLE
	9	UM-3DJ2P	BATTERY
	10	QPGA020-02005	POLY BAG
⚠	11	PU30425-1130	INSTRUCTIONS,CANADA
⚠		PU30425-1124	INSTRUCTIONS,USA
	12	TCP-3409	TAPE CATALOG
	13	QPGA025-03505	POLY BAG
	14	BT-20071A	INSTRUCTION GUIDE,CANADA
	14	BT-20046E	TOLL FREE CARD,USA
	15	BT-20062A	WARRANTY CARD,USA
		BT-20025K	WARRANTY CARD,CANADA

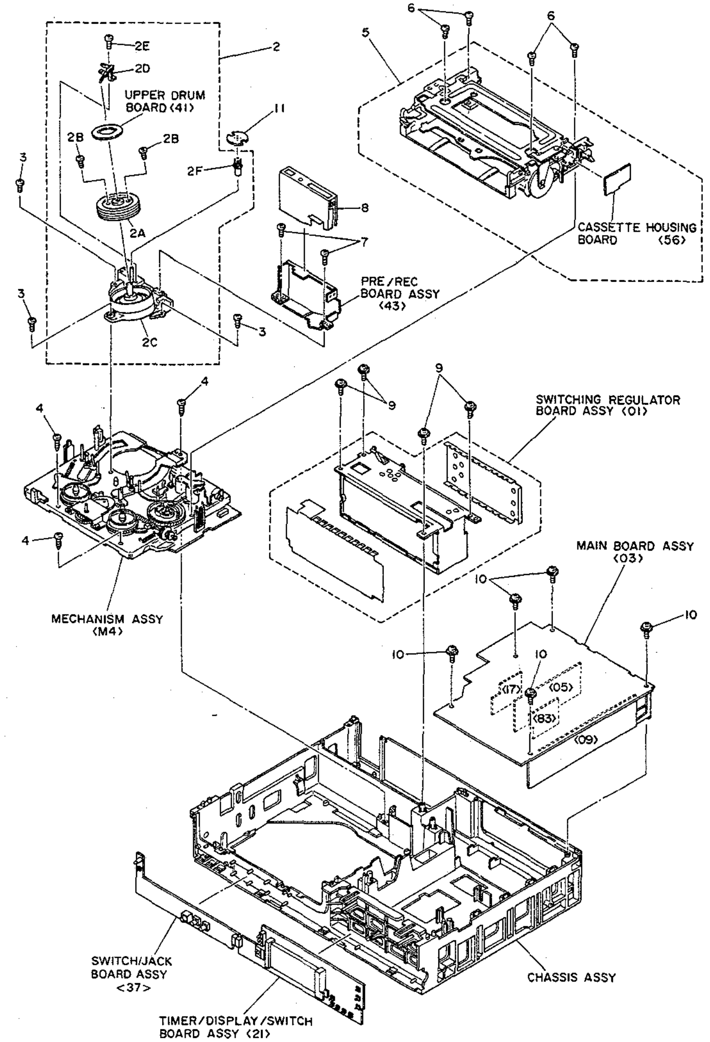
4.2 CABINET ASSEMBLY <M2>


PATENT LABEL
CAUTION LABEL
RATING LABEL
STICKER
7
6
1
1A
1B
1C
1D
1E
1G
1H
1J
1K
1L
1M
1N
1P
1R
1S
1T
1U
1V
1W
1X
3
3A
3B
4
5
11
12

CABINET ASSEMBLY <M2>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ10874B-11	FRONT PANEL ASSY
	1A	PQ20858-2	CASSETTE HOUSING DOOR
	1B	PQ43628-1-1	TORSION SPRING
	1C	PQ32948-2-3	BUTTON(POWER)
	1D	PQ32955	INDICATOR(POWER)
	1E	PQ20987-1-2	BUTTON(OPE)
	1G	PQ20856-2-3	BUTTON(1)
	1H	PQ20857-2-2	BUTTON(2)
	1J	PQ20988-1-1	COVER(FRONT)
	1K	SDSF2005Z	SCREW,X3,FOR COVER/CASS DOOR
	1L	PQ32964	EARTH PLATE
	1M	PU60109	CATCHER,X2
	1N	PQ10879-2-4	DOOR
	1P	PQ20855-2	PLATE(DOOR)
⚠	1R	PQ10875-3	FRONT PANEL
	1S	PQ32949-1-2	DISPLAY WINDOW
	1T	PQ32950-3	FILTER
	1U	PQ20859-2	PLATE(PLOG.)
	1V	PQ44389	BRACKET
	1W	PQ44563	BRACKET
	1X	PQ44586	WINDOW
	3	PQ33012B	FOOT ASS'Y,X2
	3A	PQ33013-2	FOOT(1),X2
	3B	PQ33014	FOOT(2),X2
	4	PQ33013-2	FOOT(1),X2
	5	SDSF3010Z	SCREW,X4,FOR FOOT
⚠	6	PQ10877-5	TOP COVER
	7	PQ43827	SPECIAL SCREW,X4,FOR TOP COVER
⚠	11	PQ10878	BOTTOM COVER
	12	SDSF3010Z	SCREW,FOR BOTTOM COVER

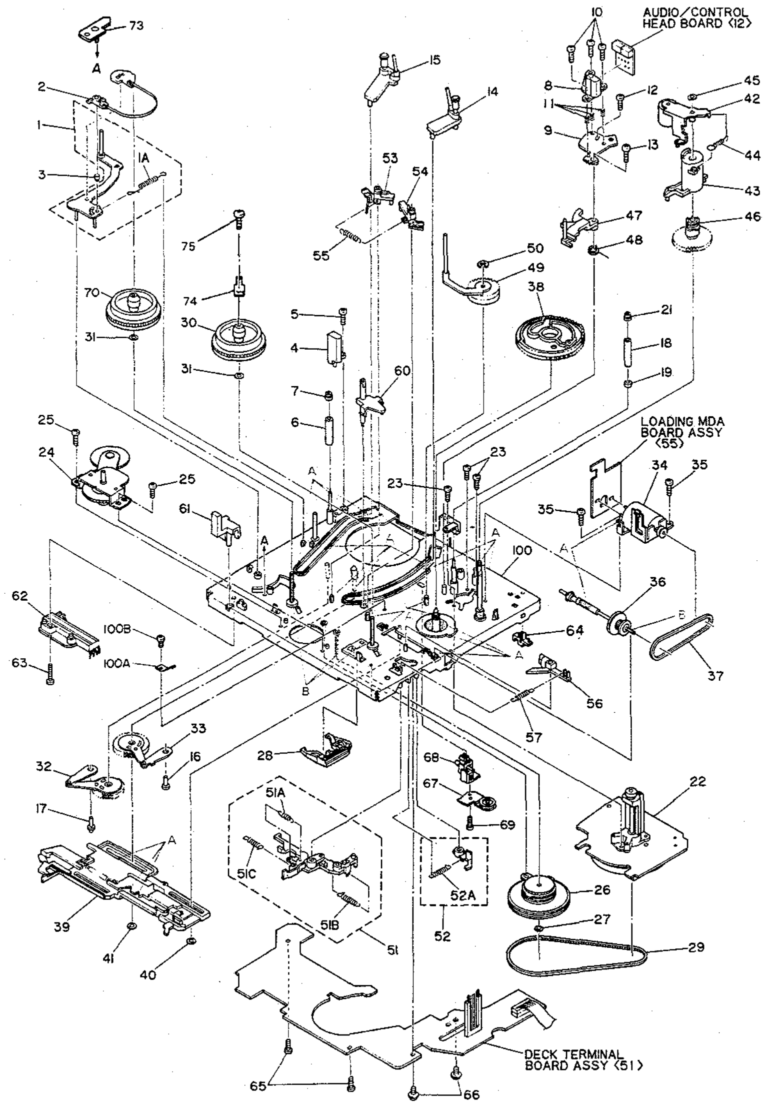
4.3 CHASSIS ASSEMBLY <M3>


2E
2D
UPPER DRUM BOARD <41>
2B
2A
2C
2F
2
11
3
4
5
6
7
8
9
10
CASSETTE HOUSING BOARD <56>
PRE/REC BOARD ASSY <43>
SWITCHING REGULATOR BOARD ASSY <01>
MAIN BOARD ASSY <03>
<17>
<05>
<83>
<09>
MECHANISM ASSY <M4>
SWITCH/JACK BOARD ASSY <37>
TIMER/DISPLAY/SWITCH BOARD ASSY <21>
CHASSIS ASSY

CHASSIS ASSEMBLY <M3>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
⚠	2	PDV2200A	DRUM ASSY
	2A	PDM2001F	UPPER DRUM ASSY
	2B	PDM4165A	DRUM SCREW ASSY,X2
	2C	PDM2138A	LOWER DRUM MOTOR ASSY
	2D	PDM4229A-1	BRUSH ASSY
	2E	SDSG2606Z	SCREW
	2F	PDM4226A	ROLLER ASSY
	3	SPST2610Z	SCREW,X3,FOR DRUM
	4	PQ43831	SPECIAL SCREW,X3,FOR MECHANIS
	5	PUS29183E	CASSETTE HOUSING ASSEMBLY
	6	SPST2608Z	SCREW,X4,FOR CASSETTE HOUSI
	or	SDST2608Z	SCREW,X4,FOR CASSETTE HOUSI
	7	SDSG2606Z	SCREW,X2,FOR PRE/REC
	8	PQ33002	SHIELD CASE(2),FOR PRE/REC
	9	GPSF2610Z	SCREW,X4,FOR SW REG
	10	GPSF2610Z	SCREW,X5,FOR MAIN
	11	PQ44230	INERTIA PLATE

4.4 MECHANISM ASSEMBLY <M4>


73
A
2
1
3
1A
75
70
74
30
31
31
10
AUDIO/CONTROL HEAD BOARD (12)
15
14
8
11
12
9
13
53
54
55
5
4
7
6
60
50
49
38
47
48
45
42
44
43
46
21
18
19
LOADING MDA BOARD ASSY (55)
34
35
35
25
24
25
61
23
23
100
36
B
37
62
100B
100A
63
64
56
57
A
B
33
32
16
17
28
51A
51C
51B
51
52A
52
68
67
69
22
26
27
29
39
41
40
65
66
DECK TERMINAL BOARD ASSY (51)

Category	Part number	MARK
Grease	KANTO-G-31KAV	A
Oil	COSMO-HV56	B

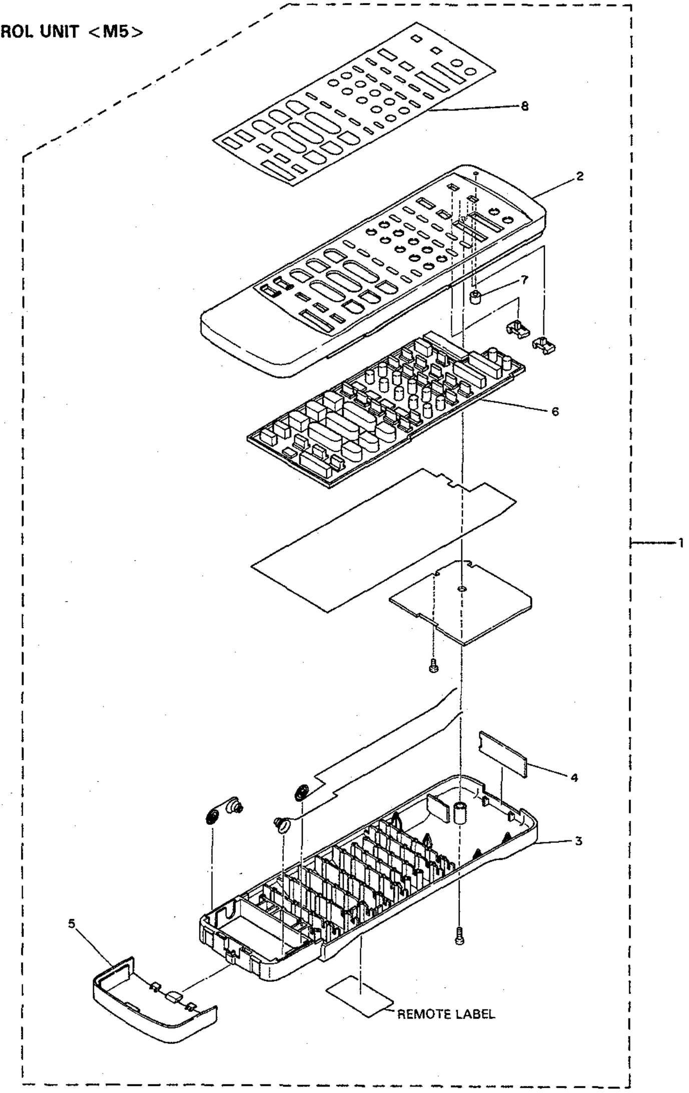
NOTE: The section marked in A and B indicate lubrication and greasing areas.

****

MECHANISM ASSEMBLY <M4>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	1	PQ43497E-8	TENSION ARM ASSY
	1A	PQ43500	TENSION SPRING
	2	PQ43501B	TENSION BAND ASSY
	3	PQ43503-1-4	ADJUST PIN
	4	PU60616	FULL ERASE HEAD
	5	SDSF2614Z	SCREW
	6	PQ43505-1-1	ROLLER
	7	PQ43506	GUIDE POLE CAP
	8	PU60617	AUDIO/CONTROL HEAD
	9	PQ43509	HEAD BASE
	10	PQ43687A	SPECIAL SCREW,X3
	11	PQM30002-192	COMPRESSION SPRING,X3
	12	SPSP2606Z	SCREW
	13	SPSF2608M	SCREW
	14	PU61103-2	POLE BASE ASSY(TU)
	15	PU61151-2	POLE BASE ASSY(SUPPLY)
	16	PQ43524	STOPPER
	17	PQ43525	STOPPER 2
	18	PQ43526-1-3	TAPE GUIDE
	19	PQ43670-1-1	GUIDE FLANGE
	20	PQ43675	TAPE GUARD
	21	PQ43506	GUIDE POLE CAP
⚠	22	PU61003	CAPSTAN MOTOR
	23	SPSG2608Z	SCREW,X3
	24	PU61004-1-3	IDLER GEAR UNIT
	25	SPST2606Z	SCREW,X2
	26	PU61005-1-2	CLUTCH UNIT
	27	PQM30017-8	SLIT WASHER
	28	PQ43532A-1	CHANGE LEVER ASSY
	29	PU61006	TIMING BELT
	30	PU60858	REEL DISK (TAKE-UP)
	31	PQM30018-54	SPACER,X2
	32	PQ43537A	LOADING ARM ASSY (SUPLLY)
	33	PQ43542B	LOADING ARM ASSY (TAKE-UP)
	34	PQ43676B-5	MODE MOTOR ASSY
		or PQ43676C	MODE MOTOR ASSY
	35	SPST2606Z	SCREW,X2
	36	PQ43548A-3	WORM CLUTCH ASSY
	37	PQM30003-23	BELT(LOADING)
	38	PQ20822-2-4	CONTROL CAM
	39	PQ44326A-1	PLATE ASSY
	40	PQM30017-12	SLIT WASHER
	41	PQM30017-8	SLIT WASHER
	42	PQ43921B	PINCH ROLLER ARM ASSY
	43	PQ32415	PINCH ROLLER PRESS LEVER
	44	PQM30001-233	TENSION SPRING
	45	PQM30017-12	SLIT WASHER
	46	PQ32416-2	PINCH ROLLER CAM
	47	PQ43567A-8	GUIDE ARM ASSY
	48	PQ43569-1-3	TORSION SPRING
	49	PQ43570A	HALF LOADING GEAR ASSY
	50	PQM30017-12	SLIT WASHER
	51	PQ43575A-5	C.LEVER ASSY
	51A	PQM30001-273	T.SPRING
	51B	PQM30001-237	TENSION SPRING
	51C	PQM30001-274	T.SPRING
	52	PQ43578A-2	HOOK ASSY
	52A	PQM30001-238	TENSION SPRING
	53	PQ43581A-6	MAIN BRAKE ASSY (SUPPLY)
	54	PQ43582A-1	MAIN BRAKE ASSY (TAKE-UP)
	55	PQM30001-251	TENSION SPRING
	56	PQ43583A	SUB BRAKE ASSY (TAKE-UP)
	57	PQM30001-298	TENSION SPRING
	60	PU60621-1-2	LED HOLDER(INC D1)
	61	PU60624-1-4	REC SAFETY SWITCH(S2)
	~~62~~	~~PU60973~~	~~SLIDE SWITCH(S3)~~
	63	SDSF2614Z	SCREW
	64	PQ32516	PWB HOLDER
	65	SDST2616Z	SCREW,X2
	66	GPSF2608Z	SCREW,X2
	67	PQ43912A-4	PULLEY ARM ASSY
	68	PQ32882	PULLEY BASE
	69	SDSF2608Z	SCREW
	70	PU60859	REEL DISK (SUPPLY)
	73	PQ44246	TENSION BRACKET 3
	74	PQ43941	R.BRACKET
	75	SPST2606Z	SCREW,FOR R BRACKET
		or SDST2606Z	SCREW,FOR R BRACKET
	100	PQ20650C-18	MAIN DECK ASSY
	100A	PQ43849	EARTH PLATE
	100B	SPST2604Z	SCREW

4.5 REMOTE CONTROL UNIT <M5>



⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	REMOTE CONTROL UNIT <M5>		
⚠	1	PQ10956A	REMOTE CONTROLLER
	2	PQ21049	UPPER CASE
	3	PQ21050	LOWER CASE
	4	PQ44726	IFR WINDOW
	5	PQ33408	CAP(BATTERY)
	6	PQ21040	BUTTON(RUBBER)
	7	PQ44725	INDICATOR
	8	PQ33400	TOP PANEL

SECTION 5
ELECTRICAL PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

SWITCHING REGULATOR BOARD ASSEMBLY <01>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB20414E	SW.REG BOARD ASSEMBLY	
⚠	Q1	2SC4130	TRANSISTOR	
	Q2	2SC3616(MLK)	TRANSISTOR	
	Q3	2SA933S(S)	TRANSISTOR	
	Q4	2SC1740S(S)	TRANSISTOR	
	Q5	2SD1468S(RS)	TRANSISTOR	
	Q6	2SB941P	TRANSISTOR	
	Q7	2SC1740S(Q)	TRANSISTOR	
	Q8	2SC1740S	TRANSISTOR	
	Q9	2SB1425(EU)	TRANSISTOR	
	Q10	DTB114ES	TRANSISTOR	
	Q11	2SA720	TRANSISTOR	
	Q12	2SA933S	TRANSISTOR	
		or 2SA1267(YG)	TRANSISTOR	
	D1	AU01	FR DIODE	
	D2	AG01	FR DIODE	
	D4	AU01Z	FR DIODE	
		or ERA48-02-T	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
	D7	RD15ES-T1B3	ZENER DIODE	
	D8	MTZV6.2A	ZENER DIODE	
	D9	11EFS2	FR DIODE	
	D10	AU01Z	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
		or ERA48-02-T	FR DIODE	
	D11	RL4Z-LFK2	FR DIODE	
	D12	AU01Z	FR DIODE	
		or 1SR153-200-T2	FR DIODE	
		or ERA48-02-T	FR DIODE	
	D13	RK14LF-B2	BARRIER DIODE	
		or 21DQ04	BARRIER DIODE	
	D14	RK14LF-B2	BARRIER DIODE	
		or 21DQ04	BARRIER DIODE	
	D15	RD30ES-T1B1	ZENER DIODE	
		or MTZ30AT-77	ZENER DIODE	
	D16	RD8.2ES-T1B1	ZENER DIODE	
	D17	UZ5.1BSC	ZENER DIODE	
		or RD5.1ES-T1B3	ZENER DIODE	
		or MTZV5.1C	ZENER DIODE	
	D19	1SS133	DIODE	
		or MA165	DIODE	
	D20	1SS133	DIODE	
		or MA165	DIODE	
	D21	RD6.8ES-T1B1	ZENER DIODE	
		or MTZ6.8AT-77	ZENER DIODE	
		or UZ6.8BSA	ZENER DIODE	
	D22	RD15ES-T1B1	ZENER DIODE	
	D23	11EFS2	FR DIODE	
	D24	1SS133	DIODE	
		or MA165	DIODE	
	D25	11ES2	DIODE	
		or ERA15-02	DIODE	
	DS1	DF04M	DIODE STACK	
⚠	R1	QRC122K-225E	RESISTOR	2.2MΩ,1/2W
	R2	QRM025K-1R0	MP RESISTOR	1Ω/2W
⚠	R3	QRG029J-683A	OMF RESISTOR	68kΩ/2W
	R4	QRD161J-683	RESISTOR	68kΩ,1/6W
	R5	QRD161J-683	RESISTOR	68kΩ,1/6W
	R6	QRD161J-473	RESISTOR	47kΩ,1/6W
⚠	R7	QRG019J-101A	OMF RESISTOR	100Ω,1W
	R8	QRD161J-102	RESISTOR	1kΩ,1/6W
	R9	QRD161J-122	RESISTOR	1.2kΩ,1/6W
	R10	QRX014J-R27	MF RESISTOR	0.27Ω,1W
	R11	QRD161J-471	RESISTOR	470Ω,1/6W
	R14	QRD161J-471	RESISTOR	470Ω,1/6W
	R15	QRD161J-821	RESISTOR	820Ω,1/6W
	R16	QRV144F-4750AY	CMF RESISTOR	475Ω,1/4W
	R17	QRV144F-4320AY	CMF RESISTOR	432Ω,1/4W
	R18	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R19	QRD161J-333	RESISTOR	33kΩ,1/6W
⚠	R20	QRZ0077-101X	FUSIBLE RESISTOR	100Ω
⚠	R21	QRZ0077-470X	FUSIBLE RESISTOR	47Ω
	R22	QRD161J-102	RESISTOR	1kΩ,1/6W
	R23	QRD161J-103	RESISTOR	10kΩ,1/6W
	R24	QRD161J-221	RESISTOR	220Ω,1/6W
	R25	QRD161J-471	RESISTOR	470Ω,1/6W
	R26	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R27	QRD161J-102	RESISTOR	1kΩ,1/6W
	R28	QVZ3518-471AZ	V RESISTOR,SWD 5V ADJ	
		or QVZ3523-471AZ	V RESISTOR,SWD 5V ADJ	
	R29	QRD161J-103	RESISTOR	10kΩ,1/6W
	R30	QRD161J-103	RESISTOR	10kΩ,1/6W
	R32	QRD161J-102	RESISTOR	1kΩ,1/6W
	R33	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R34	QRD161J-822	RESISTOR	8.2kΩ,1/6W
	R35	QRD161J-102	RESISTOR	1kΩ,1/6W
⚠	C1	QCZ9016-103P	CAPACITOR	0.01μF,125V
⚠	C2	QCZ9016-103P	CAPACITOR	0.01μF,125V
⚠	C3	QCZ9052-102	CAPACITOR	0.001μF
⚠	C4	QCZ9052-102	CAPACITOR	0.001μF
⚠	C5	QCZ9052-222	CAPACITOR	0.0022μF
	C6	PU61024-107	E CAPACITOR	100μF,200V
	C7	QCY53AK-472	CAPACITOR	0.0047μF,1kV
⚠	C8	QCZ9016-103P	CAPACITOR	0.01μF,125V
	C9	QED61HM-475	E CAPACITOR	4.7μF,50V
	C10	QFV41HJ-334	TF CAPACITOR	0.33μF,50V
	C11	QFL41HJ-472	MY CAP	0.0047μF,50V
	C12	QFN31HJ-103	M CAPACITOR	0.01μF,50V
	C14	QFV41HJ-104	TF CAPACITOR	0.1μF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C15	QFL41HJ-103	MY CAP	0.01μF,50V
	C17	QETC1JM-476	E CAPACITOR	47μF,63V
	C18	QETC1HM-476	E CAPACITOR	47μF,50V
	C19	QEZ0137-687	E CAPACITOR	680μF,16V
		or QEZ0105-687	E CAPACITOR	680μF,16V
⚠	C20	QEZ0136-128	E CAPACITOR	1200μF,10V
⚠		or QEZ0106-128	E CAPACITOR	1200μF,10V
	C21	QETC1HM-226	E CAPACITOR	22μF,50V
	C22	QETC1JM-226	E CAPACITOR	22μF,63V
	C23	QETB1CM-108	E CAPACITOR	1000μF,16V
	C24	QEZ0136-158	E CAPACITOR	1500μF,10V
		or QEZ0106-158	E CAPACITOR	1500μF,10V
	C25	QETC1AM-107	E CAPACITOR	100μF,10V
	C26	QFN31HJ-103	M CAPACITOR	0.01μF,50V
	C28	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C29	QETC1CM-107	E CAPACITOR	100μF,16V
	C30	QETC1AM-107	E CAPACITOR	100μF,10V
	C31	QETB1CM-107	E CAPACITOR	100μF,16V
	C32	QETC1CM-107	E CAPACITOR	100μF,16V
	C33	QEZ0156-127Z	E CAPACITOR	120μF
	C34	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C37	QETC1VM-226	E CAPACITOR	22μF,35V
⚠	C38	QEZ0138-477	E CAPACITOR	470μF,25V
⚠		or QEZ0125-477	E CAPACITOR	470μF,25V
	C39	QETB1EM-477	E CAPACITOR	470μF,25V
	C40	QETC1AM-226	E CAPACITOR	22μF,10V
	L1	PU60943-330K	COIL	33μH
		or PELN0270-330K	COIL	33μH
	L2	PU60943-330K	COIL	33μH
		or PELN0270-330K	COIL	33μH
	L3	PU48530-330K	COIL	33μH
	L4	PU60943-330K	COIL	33μH
		or PELN0270-330K	COIL	33μH
⚠	PHS1	PC817	PHOTO COUPLER	
⚠		or PS2501-1	PHOTO COUPLER	
⚠	POC1	QMP14B0-200T	POWER CORD	
⚠		or QMP14B0-200TE	POWER CORD	
⚠	RY1	PU60989	RELAY	
⚠		or PU61093	POWER RELAY	
⚠		or PESW0534	RELAY	
⚠	T1	PELN0229-02	SW TRANS	
⚠	AO1	QMC0242-007	AC OUTLET	
⚠	BKT1	PQ33007	BRACKET(SW.REG)	
	ETH1	PQ43872	EARTH PLATE	
⚠	ETH2	PQ44613	EARTH PLATE	
⚠	HD1	QHS3771-108	STRAIN RELIEF	
⚠	HD2	PU57505	FUSE CLIP,X2	
⚠	HS1	PQ44026-1-1	HEAT SINK	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
⚠	LF1	PU59707	LINE FILTER
⚠		or PELN0255	LINE FILTER
	SCW1	SDST2605Z	SCREW,X3
	SCW2	SDSG3008Z	SCREW
	SCW3	SDSG3006Z	SCREW
	SLD1	PQ20893	SHIELD CASE(1)
	SLD2	PQ33004	SHIELD CASE(2)
	SLD3	PQ33005	SHIELD CASE(3)
	SLD4	PQ33006	SHIELD CASE(4)
	SPC1	PQM30029-141	SPACER
	TP1	PU55774	TEST PIN,X3(TP1-3)
	CN1	PU59555-110	CAP HOUSING
	CN2	PU60910-111	CAP HOUSING
⚠	CP1	ICP-N10-T	CIRCUIT PROTECTOR
⚠	CP2	ICP-N20-T	CIRCUIT PROTECTOR
⚠	F1	QMF51N2-R70J1	FUSE

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MAIN BOARD ASSEMBLY <03>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWBA	PB10380A-02	MAIN BOARD ASSEMBLY
	PWBA1	PB10380A1-02	MAIN BOARD ASSY
⚠	RF1	PU60508S	RF CONVERTER/SWITCH
	ETH1	PQ43754-1-2	EARTH PLATE
	HD1	PEME0767	WIRE HOLDER
	JA2	PU61149-3	PIN JACK
	JA3	PU61150	PIN JACK(SW)
	JA4	PU61149	PIN JACK
	JA5	PU61149	PIN JACK
	JA6	PU60612	EARPHONE JACK
		or PU61012	MINI JACK
	SCW1	SDST2605Z	SCREW
	SPC1	PQM30018-60	SPACER
		PU60010-2	SPACER,X2
⚠	TB1	PQ10888-6	TERMINAL BOARD
	TP205	PEMC0726-030C	TEST PIN,X19
		or PEMC0727	TEST PIN,X19

—TUNER/IF SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC1	M51365SP	IC	
	Q2	2SC3354	TRANSISTOR	
	Q3	2SC1317(RS)	TRANSISTOR	
	Q4	2SA933S(S)	TRANSISTOR	
	Q5	2SA1532(C)	TRANSISTOR	
	Q6	2SC3354	TRANSISTOR	
	Q11	2SC4081(S)	TRANSISTOR	
	Q12	XN2401	TRANSISTOR	
	Q14	XN1501	TRANSISTOR	
	Q15	DTA123EU	TRANSISTOR	
	Q16	2SC4081(S)	TRANSISTOR	
	D1	MTZ10B	ZENER DIODE	
	R1	QRSA08J-750YN	RESISTOR	75Ω,1/10W
	R3	QRD161J-181	RESISTOR	180Ω,1/6W
	R4	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R5	QRSA08J-220YN	RESISTOR	22Ω,1/10W
	R6	QRSA08J-122YN	RESISTOR	1.2kΩ,1/10W
	R7	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R8	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R9	QRSA08J-330YN	RESISTOR	33Ω,1/10W
	R14	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R15	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R16	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
	R17	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R18	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R19	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R20	QRSA08J-392YN	RESISTOR	3.9kΩ,1/10W
	R21	QVZ3518-102AZ	V RESISTOR,RF AGC	
	R22	QRSA08J-824YN	RESISTOR	820kΩ,1/10W
	R23	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R24	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R25	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R26	QRSA08J-104	RESISTOR	100kΩ,1/10W
	R28	QRSA08J-184YN	RESISTOR	180kΩ,1/10W
	R31	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R33	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R34	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R35	QRSA08J-561YN	RESISTOR	560Ω,1/10W
	R36	QRSA08J-561YN	RESISTOR	560Ω,1/10W
	R37	QRSA08J-301YN	RESISTOR	300Ω,1/10W
	R38	QRSA08J-272YN	RESISTOR	2.7kΩ,1/10W
	R39	QRSA08J-152	RESISTOR	1.5kΩ,1/10W
	R40	QVZ3518-682AZ	V RESISTOR,COLOR LEVEL	
	R45	QRSA08J-823YN	RESISTOR	82kΩ,1/10W
	R47	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R51	QRSA08J-152	RESISTOR	1.5kΩ,1/10W
	R57	QRD161J-562	RESISTOR	5.6kΩ,1/6W
	R61	QRD161J-181	RESISTOR	180Ω,1/6W
	R62	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R63	QRSA08J-152	RESISTOR	1.5kΩ,1/10W
	R64	QRSA08J-152	RESISTOR	1.5kΩ,1/10W
	R66	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R67	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R68	QRSA08J-330YN	RESISTOR	33Ω,1/10W
	R72	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R73	QRSA08J-104	RESISTOR	100kΩ,1/10W
	R74	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R75	QRSA08J-682	RESISTOR	6.8kΩ,1/10W
	R76	QRSA08J-682	RESISTOR	6.8kΩ,1/10W
	R77	QRSA08J-181YN	RESISTOR	180Ω,1/10W
	R78	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R80	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
	R81	QRSA08J-154YN	RESISTOR	150kΩ,1/10W
	R82	QRSA08J-563YN	RESISTOR	56kΩ,1/10W
	R83	QRSA08J-184YN	RESISTOR	180kΩ,1/10W
	R84	QRSA08J-4R7YN	RESISTOR	4.7Ω,1/10W
	R85	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
	R86	QRSA08J-822YN	RESISTOR	8.2kΩ,1/10W
	C5	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C6	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C7	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C8	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C10	QEK61CM-336	E CAPACITOR	33μF,16V
	C13	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C14	PU57601-474ME	E CAPACITOR	0.47μF
	C15	QEK61CM-336	E CAPACITOR	33μF,16V
	C16	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C17	QCYA1HK-473	CAPACITOR	0.047μF,50V
	C18	QFV71HJ-104	TF CAPACITOR	0.1μF,50V
	C19	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C20	QCYA1HK-222	CAPACITOR	0.0022μF,50V
	C21	QCTA1CH-101	CAPACITOR	100pF,16V
	C24	QEK61HM-105	E CAPACITOR	1μF,50V
	C25	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C26	QFN31HJ-123	M CAPACITOR	0.012μF,50V
	C27	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C28	QCTA1CH-100	CAPACITOR	10pF,16V
	C29	QCTA1CH-150	CAPACITOR	15pF,16V
	C30	QCYA1HK-223	CAPACITOR	0.022μF,50V
	C31	QETC1CM-476	E CAPACITOR	47μF,16V
	C32	QEK61CM-336	E CAPACITOR	33μF,16V
	C41	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C42	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C45	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C46	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C48	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C51	QETC1HM-335	E CAPACITOR	3.3μF,50V
	C53	QCYA1HK-332	CAPACITOR	0.0033μF,50V
	C54	QETC1CM-476	E CAPACITOR	47μF,16V
	L1	PU60025-1R3	COIL	1.3μH
	L2	PU60025-1R1	COIL	1.1μH
	L3	PU60025-R33S	COIL	0.33μH
	L4	PU59152-180J	COIL	18μH
	L5	PU59152-560J	COIL	56μH
	L6	PU59152-470J	COIL	47μH
⚠	CF1	PU60774-Z	CERAMIC FILTER	
	CF3	PU61039-Z	CERAMIC FILTER	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	SAW1	PEVB0336	SAW FILTER	
	SAW2	PU60765-4	SAW FILTER	
	T2	PU60027-01-01S	IF.TRANSFORMER	
	T3	PU60028S	IF.TRANSFORMER	
	T4	PU60104S	IF.TRANSFORMER	
	T8	PU60264S	COIL	

—TUNER/CTL SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
⚠	TNR1	PU36512-2	TUNER	
	Q101	2SD1450S,T	TRANSISTOR	
	D101	E-452-2-T2	DIODE	
	D102	HZ30-2L	ZENER DIODE	
	R102	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
	R105	QRSA08J-104	RESISTOR	100kΩ,1/10W
	R113	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R118	QRSA08J-102	RESISTOR	1kΩ,1/10W
	C102	QETC1HM-106	E CAPACITOR	10μF,50V
	C105	QETC1HM-105	E CAPACITOR	1μF,50V
	C109	QETC1CM-336	E CAPACITOR	33μF,16V
	C110	QCYA1HK-103	CAPACITOR	0.01μF,50V
	C111	QETC1CM-336	E CAPACITOR	33μF,16V
	C131	QETC1CM-336	E CAPACITOR	33μF,16V
	C132	QCYA1HK-222	CAPACITOR	0.0022μF,50V

—VIDEO SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	Q203	2SC4081(QRS)	TRANSISTOR	
	Q204	2SC4081(QRS)	TRANSISTOR	
	Q205	2SC4081(QRS)	TRANSISTOR	
	Q206	2SA1576(QRS)	TRANSISTOR	
	D207	1SS133	DIODE	
		or MA165	DIODE	
	R210	QVZ3518-102AZ	V RESISTOR,SP REC COLOR	
	R211	QRSA08J-750YN	RESISTOR	75Ω,1/10W
	R212	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R213	QRSA08J-750YN	RESISTOR	75Ω,1/10W
	R214	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R215	QRSA08J-682	RESISTOR	6.8kΩ,1/10W
	R216	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R217	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
	R218	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R219	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R221	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R222	QRSA08J-152	RESISTOR	1.5kΩ,1/10W
	R223	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R224	QRSA08J-822YN	RESISTOR	8.2kΩ,1/10W
	R228	QVZ3518-102AZ	V RESISTOR,EP REC COLOR	
	R233	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R234	QRD161J-101	RESISTOR	100Ω,1/6W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R235	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R236	QRSA08J-0R0YN	RESISTOR	0Ω,1/10W
	R237	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R239	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R242	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R244	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	C208	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C209	QEK60JM-476	E CAPACITOR	47μF,6.3V
	C210	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C211	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C212	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C213	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C214	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C228	QCSA1HJ-430	CAPACITOR	43pF,50V
	L203	PU48530-101K	COIL	100μH
	CN201	PU58844-6	CAP HOUSING	
	CN202	PU59555-8	CAP HOUSING	

—AUDIO SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	D302	1SS133	DIODE	
		or MA165	DIODE	
	R301	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R302	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R303	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R304	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R305	QVZ3518-472AZ	V RESISTOR,IND(R)	
	R306	QVZ3518-472AZ	V RESISTOR,IND(L)	
	R307	QVZ3518-473AZ	V RESISTOR,BIAS ADJ	
	R308	QRSA08J-100YN	RESISTOR	10Ω,1/10W
	R309	QVZ3518-102AZ	V RESISTOR,PB LEVEL	
	R314	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R315	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R317	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R318	QRSA08J-102	RESISTOR	1kΩ,1/10W
	C301	QEK61HM-105	E CAPACITOR	1μF,50V
	C302	QEK61HM-105	E CAPACITOR	1μF,50V
	CN301	PU58844-2	CAP HOUSING	
	CN302	PU58844-4	CAP HOUSING	
	CN303	PU58844-4	CAP HOUSING	
	CN304	PU58844-2	CAP HOUSING	
	CN305	PU59555-6	CAP HOUSING	
⚠	CP301	ICP-N10-T	CIRCUIT PROTECTOR	

—SERVO SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC401	HD49733NT	IC	
		or HD49733ANT	IC	
	Q401	2SA1576(QRS)	TRANSISTOR	
	D402	1SS133	DIODE	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
		or MA165	DIODE	
	D403	1SS133	DIODE	
		or MA165	DIODE	
	D404	DAN202U	DIODE	
	D406	DAN202U	DIODE	
	D407	1SS133	DIODE	
		or MA165	DIODE	
	D408	1SS133	DIODE	
		or MA165	DIODE	
	D411	1SS133	DIODE	
		or MA165	DIODE	
	D412	1SS133	DIODE	
		or MA165	DIODE	
	R401	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R402	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R403	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R404	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R405	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R406	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R407	QRSA08J-823YN	RESISTOR	82kΩ,1/10W
	R408	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R409	QRSA08J-104	RESISTOR	100kΩ,1/10W
	R410	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R411	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R412	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R413	QRSA08J-682	RESISTOR	6.8kΩ,1/10W
	R414	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R415	QRSA08J-473	RESISTOR	47kΩ,1/10W
	R416	QRSA08J-684YN	RESISTOR	680kΩ,1/10W
	R417	QRSA08J-474YN	RESISTOR	470kΩ,1/10W
	R418	QRSA08J-224YN	RESISTOR	220kΩ,1/10W
	R419	QRSA08J-823YN	RESISTOR	82kΩ,1/10W
	R420	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R421	QRSA08J-393YN	RESISTOR	39kΩ,1/10W
	R422	QRSA08J-822YN	RESISTOR	8.2kΩ,1/10W
	R423	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R424	QRSA08J-124YN	RESISTOR	120kΩ,1/10W
	R425	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R426	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R427	QVZ3518-474AZ	V RESISTOR,SW POINT	
	R428	QRSA08J-473	RESISTOR	47kΩ,1/10W
	R429	QRSA08J-104	RESISTOR	100kΩ,1/10W
	R434	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R435	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R440	QRSA08J-225YN	RESISTOR	2.2MΩ,1/10W
	C401	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C402	QEK61AM-226	E CAPACITOR	22μF,10V
	C403	QEK61AM-226	E CAPACITOR	22μF,10V
	C404	QCTA1CH-101	CAPACITOR	100pF,16V
	C406	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C407	QEK61HM-105	E CAPACITOR	1μF,50V
	C408	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C409	QFV71HJ-563	TF CAPACITOR	0.056μF,50V
	C410	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C413	QEK61AM-226	E CAPACITOR	22μF,10V
	C414	QFV71HJ-104	TF CAPACITOR	0.1μF,50V

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	C415	QFL31HJ-472	M CAPACITOR	0.0047μF,50V
	C416	QEK61EM-475	E CAPACITOR	4.7μF,25V
	C417	QEK61EM-475	E CAPACITOR	4.7μF,25V
	C418	QEK61CM-106	E CAPACITOR	10μF,16V
	C419	QEK61CM-106	E CAPACITOR	10μF,16V
	C420	QFV71HJ-473	TF CAPACITOR	0.047μF,50V
	C421	QEP61HM-105	NP E CAPACITOR	1μF,50V
	C422	QCTA1CH-101	CAPACITOR	100pF,16V
	C423	QFL31HJ-682	M CAPACITOR	0.0068μF,50V
	C426	QCTA1CH-181	CAPACITOR	180pF,16V
	CN401	PU58844-3	CAP HOUSING	
	CN402	PU59555-4	CAP HOUSING	
	CN452	PEMC0714-011	CAP HOUSING	
⚠	CP401	ICP-N15-T	CIRCUIT PROTECTOR	

—DEMODULATOR SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC502	CXA1011P	IC	
	Q502	DTA114EU	TRANSISTOR	
	Q503	DTA144EU	TRANSISTOR	
	Q504	2SD1328S,T	TRANSISTOR	
	Q505	2SD1328S,T	TRANSISTOR	
	Q506	2SD1328S,T	TRANSISTOR	
	Q507	DTA124EU	TRANSISTOR	
	Q508	DTA124EU	TRANSISTOR	
	Q509	DTC114EU	TRANSISTOR	
	Q510	DTC114EU	TRANSISTOR	
	D501	1SS133	DIODE	
	D502	1SS133	DIODE	
	D503	MA141WA	DIODE	
		or DAP202U	DIODE	
	D505	1SS133	DIODE	
	D506	1SS133	DIODE	
	D509	1SS133	DIODE	
	D510	1SS133	DIODE	
	R509	QVZ3518-472AZ	V RESISTOR,SAP LEVEL	
	R519	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R520	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R525	QRSA08J-752YN	RESISTOR	7.5kΩ,1/10W
	R526	QRV144F-5603AY	CMF RESISTOR	560kΩ,1/4W
	R527	QRV144F-2322AY	CMF RESISTOR	23.2kΩ,1/4W
	R528	QRSA08J-272YN	RESISTOR	2.7kΩ,1/10W
	R529	QRSA08J-153	RESISTOR	15kΩ,1/10W
	R530	QRSA08J-561YN	RESISTOR	560Ω,1/10W
	R531	QRSA08J-361YN	RESISTOR	360Ω,1/10W
	R532	QRSA08J-682	RESISTOR	6.8kΩ,1/10W
	R533	QRSA08J-301YN	RESISTOR	300Ω,1/10W
	R534	QRSA08J-272YN	RESISTOR	2.7kΩ,1/10W
	R539	QRSA08J-151YN	RESISTOR	150Ω,1/10W
	R540	QRSA08J-151YN	RESISTOR	150Ω,1/10W
	R541	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R542	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R543	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R544	QRSA08J-561YN	RESISTOR	560Ω,1/10W
	R545	QRSA08J-473	RESISTOR	47kΩ,1/10W
	C524	QEK61CM-106	E CAPACITOR	10μF,16V
	C525	QEE81CJ-335	TANTAL CAPACITOR	3.3μF,16V
	C526	QEK61HM-105	E CAPACITOR	1μF,50V
	C527	QEE81CJ-106	TANTAL CAPACITOR	10μF,16V
	C528	QEK61HM-225	E CAPACITOR	2.2μF,50V
	C529	QEK61CM-106	E CAPACITOR	10μF,16V
	C530	QFL31HJ-472	M CAPACITOR	0.0047μF,50V
	C531	QENC1CM-106	NP E CAPACITOR	10μF,16V
	C532	QFV71HJ-223	TF CAPACITOR	0.022μF,50V
	C533	QFV71HJ-104	TF CAPACITOR	0.1μF,50V
	C534	QEK61HM-105	E CAPACITOR	1μF,50V
	C535	QETC1CM-107	E CAPACITOR	100μF,16V
	C536	QEK61HM-105	E CAPACITOR	1μF,50V
	CN501	PU58844-3	CAP HOUSING	
	CN502	PU58844-10	CAP HOUSING	

—MECHACON SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	IC601	M37418M6-244SP	IC	
		or M37418E6-112SP	IC	
	Q601	2SB1425(EU)	TRANSISTOR	
	Q602	DTC114EU	TRANSISTOR	
	D601	HZS7.5EB2	ZENER DIODE	
		or MTZ7.5B	ZENER DIODE	
	D602	MA165	DIODE	
		or 1SS133	DIODE	
	D603	MA165	DIODE	
		or 1SS133	DIODE	
	D604	DAP202U	DIODE	
	D606	11ES2	DIODE	
	D610	1SS133	DIODE	
	R601	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R602	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R603	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R605	QRSA08J-154YN	RESISTOR	150kΩ,1/10W
	R607	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R608	QRD161J-563	RESISTOR	56kΩ,1/6W
	R609	QRSA08J-303YN	RESISTOR	30kΩ,1/10W
	R610	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R611	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R612	QRSA08J-224YN	RESISTOR	220kΩ,1/10W
	R613	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R614	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R615	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R617	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R618	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R619	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R620	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R621	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R622	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R623	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R624	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R625	QRSA08J-472	RESISTOR	4.7kΩ,1/10W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R626	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R627	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R628	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R629	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R630	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R631	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R632	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R633	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R634	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R636	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R639	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R640	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R641	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R642	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R644	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R645	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R646	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R647	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R648	QRSA08J-152	RESISTOR	1.5kΩ,1/10W
	R649	QRSA08J-682	RESISTOR	6.8kΩ,1/10W
	R650	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R651	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R652	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R653	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R654	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R655	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R656	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R657	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	RA601	QRB035J-103XC	RESISTOR ARRAY	
	C601	QEK61HM-105	E CAPACITOR	1μF,50V
	C602	QEK61EM-335	E CAPACITOR	3.3μF,25V
	C603	QETC0JM-107	E CAPACITOR	100μF,6.3V
	C604	QCFA1HZ-473	CAPACITOR	0.047μF,50V
	C605	QCFA1HZ-223	CAPACITOR	0.022μF,50V
	C610	QFN31HJ-473	M CAPACITOR	0.047μF,50V
	L601	PU59152-100J	COIL	10μH
⚠	CF601	PU60440	RESONATOR	
⚠		or PU60440-2	C RESONATER	
	CN601	PEMC0722-017	WIRE TRAP	
		or PEMC0753-017	WIRE TRAP	
	CN602	PU59555-4	CAP HOUSING	
⚠	CP601	ICP-N25-T	CIRCUIT PROTECTOR	
⚠	CP602	ICP-N20	CIRCUIT PROTECTOR	

—REGULATOR SECTION—

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	Q801	2SA1020	TRANSISTOR	
		or 2SB1010(QR)	TRANSISTOR	
	Q804	2SA1576(RS)	TRANSISTOR	
	Q808	DTC114ES	TRANSISTOR	
	D801	1SS133	DIODE	
		or MA165	DIODE	
	D802	1SS133	DIODE	
		or MA165	DIODE	
	D803	1SS133	DIODE	
		or MA165	DIODE	
	D804	1SS133	DIODE	
		or MA165	DIODE	
	R801	QRD161J-222	RESISTOR	2.2kΩ,1/6W
	R804	QRD162J-182	RESISTOR	1.8kΩ,1/6W
	R806	QRSA08J-393YN	RESISTOR	39kΩ,1/10W
	R807	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R809	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	C801	QETC1CM-336	E CAPACITOR	33μF,16V
	C821	QETC1CM-336	E CAPACITOR	33μF,16V
	C822	QCYA1HK-102	CAPACITOR	0.001μF,50V
	L801	PU48530-101K	COIL	100μH
	CN801	PU61044-11	CAP HOUSING	
	CN802	PU60910-6	CAP HOUSING	
	CN803	PU59555-9	CAP HOUSING	
⚠	CP801	ICP-N15-T	CIRCUIT PROTECTOR	
⚠	CP802	ICP-N10-T	CIRCUIT PROTECTOR	
⚠	CP803	ICP-N15	CIRCUIT PROTECTOR	

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VIDEO UNIT BOARD ASSEMBLY <05>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10321A-01	VIDEO UNIT BOARD ASSEMBLY	
	IC1	PB20166A-01	Y MODULE ASSY	
⚠	IC2	MSM6866RS	IC	
	IC201	HA118125NT	IC	
	Q1	DTC144WU	TRANSISTOR	
	Q2	2SC4081(QRS)	TRANSISTOR	
	Q3	DTA114EU	TRANSISTOR	
	Q4	2SA1577(Q)	TRANSISTOR	
	Q5	2SA1576(QRS)	TRANSISTOR	
	Q6	DTA114EU	TRANSISTOR	
	Q7	DTA144EU	TRANSISTOR	
	Q8	2SC4081(QRS)	TRANSISTOR	
	Q9	DTC144EU	TRANSISTOR	
	Q10	2SA1576(QRS)	TRANSISTOR	
	Q11	DTC144WU	TRANSISTOR	
	Q12	2SA1576(QRS)	TRANSISTOR	
	Q13	2SC4081(QRS)	TRANSISTOR	
	Q14	DTC144EU	TRANSISTOR	
	Q15	DTA124EU	TRANSISTOR	
	Q16	2SC4081(QRS)	TRANSISTOR	
	Q201	2SC4098(PQ)	TRANSISTOR	
	Q202	DTC144WU	TRANSISTOR	
	Q203	DTA144WU	TRANSISTOR	
	Q204	DTC124EU	TRANSISTOR	
	D1	1SS133	DIODE	
		or MA165	DIODE	
	D2	1SS133	DIODE	
		or MA165	DIODE	
	D3	1SS133	DIODE	
		or MA165	DIODE	
	D4	1SS133	DIODE	
		or MA165	DIODE	
	D5	1SS292	DIODE	
	D6	1SS133	DIODE	
		or MA165	DIODE	
	D7	1SS133	DIODE	
		or MA165	DIODE	
	D8	RD9.1ES-T1B2	ZENER DIODE	
		or UZ9.1BSB	ZENER DIODE	
	D9	1SS133	DIODE	
		or MA165	DIODE	
	D10	1SS133	DIODE	
		or MA165	DIODE	
	D11	1SS133	DIODE	
		or MA165	DIODE	
	D12	1SS133	DIODE	
		or MA165	DIODE	
	D13	1SS133	DIODE	
		or MA165	DIODE	
	D14	1SS133	DIODE	
		or MA165	DIODE	
	D15	1SS133	DIODE	
		or MA165	DIODE	
	D16	1SS133	DIODE	
		or MA165	DIODE	
	D17	1SS133	DIODE	
		or MA165	DIODE	
	D18	1SS133	DIODE	
		or MA165	DIODE	
	D19	1SS133	DIODE	
		or MA165	DIODE	
	D201	1SS133	DIODE	
		or MA165	DIODE	
	D202	1SS133	DIODE	
		or MA165	DIODE	
	D203	1SS133	DIODE	
		or MA165	DIODE	
	D204	MA141WK	DIODE	
		or DAN202U	DIODE	
	D205	1SS133	DIODE	
		or MA165	DIODE	
	D206	1SS133	DIODE	
		or MA165	DIODE	
	D207	MA141WK	DIODE	
		or DAN202U	DIODE	
	D208	1SS133	DIODE	
		or MA165	DIODE	
	R1	QRSA08J-272YN	RESISTOR	2.7kΩ,1/10W
	R2	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R3	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R4	QRD161J-331	RESISTOR	330Ω,1/6W
	R5	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R6	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R7	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
	R8	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R9	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R10	QRSA08J-822YN	RESISTOR	8.2kΩ,1/10W
	R11	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
	R12	QRD123J-391SX	RESISTOR	390Ω,1/2W
	R13	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
	R14	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R15	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R16	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R17	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R18	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R19	QRSA08J-272YN	RESISTOR	2.7kΩ,1/10W
	R20	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R21	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R22	QRSA08J-104YN	RESISTOR	100kΩ,1/10W
	R23	QRSA08J-272YN	RESISTOR	2.7kΩ,1/10W
	R24	QRSA08J-334YN	RESISTOR	330kΩ,1/10W
	R25	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R26	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R28	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R29	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R30	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R31	QVZ3518-222AZ	V RESISTOR,YNR NC BAL	
		or QVZ3523-222AZ	V RESISTOR,YNR NC BAL	
	R32	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
	R33	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R34	QRSA08J-392YN	RESISTOR	3.9kΩ,1/10W
	R35	QRD161J-181	RESISTOR	180Ω,1/6W
	R37	QRD161J-182	RESISTOR	1.8kΩ,1/6W
	R38	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R39	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R40	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R41	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
	R42	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R43	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R201	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R202	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R203	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R204	QRD161J-103	RESISTOR	10kΩ,1/6W
	R205	QRSA08G-102YN	RESISTOR	1kΩ,1/10W
	R206	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R207	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R208	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R209	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R210	QRD161J-102	RESISTOR	1kΩ,1/6W
	R211	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R212	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R213	QRD161J-102	RESISTOR	1kΩ,1/6W
	R214	QRD161G-471	RESISTOR	470Ω,1/6W
	R215	QRSA08G-751YN	RESISTOR	750Ω,1/10W
	R216	QRSA08J-104YN	RESISTOR	100kΩ,1/10W
	R217	QRSA08J-155YN	RESISTOR	1.5MΩ,1/10W
	R218	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R219	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	C1	QCSA1HJ-270	CAPACITOR	27pF,50V
	C2	QCSA1HJ-470	CAPACITOR	47pF,50V
	C3	QETC1AM-226	E CAPACITOR	22μF,10V
	C4	QETC1HM-335	E CAPACITOR	3.3μF,50V
	C5	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C6	QCSA1HJ-200	CAPACITOR	20pF,50V
	C7	QCSA1HJ-330	CAPACITOR	33pF,50V
	C8	QCSA1HJ-271	CAPACITOR	270pF,50V
	C9	QCSA1HJ-181	CAPACITOR	180pF,50V
	C10	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C11	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C12	QETC1CM-336	E CAPACITOR	33μF,16V
	C13	QETC0JM-108	E CAPACITOR	1000μF,6.3V
	C14	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C15	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C16	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C17	QCSA1HJ-220	CAPACITOR	22pF,50V
	C18	QCSA1HJ-270	CAPACITOR	27pF,50V
	C19	QEN61AM-336	NP E CAPACITOR	33μF,10V
		or QENC1AM-336	NP E CAPACITOR	33μF,10V
	C20	QETC1CM-106	E CAPACITOR	10μF,16V
	C21	QETC1HM-224	E CAPACITOR	0.22μF,50V
	C22	QETC1EM-335	E CAPACITOR	3.3μF,25V
	C23	QCC31CK-823	CAPACITOR	0.082μF,16V
	C24	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C25	QETC1EM-335	E CAPACITOR	3.3μF,25V
	C26	QEN61HM-225	NP E CAPACITOR	2.2μF,50V
		or QENC1HM-225	NP.E CAPACITOR	2.2μF,50V
	C27	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C28	QETC1HM-334	E CAPACITOR	0.33μF,50V
	C29	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C30	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C31	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C32	QCSA1HJ-330	CAPACITOR	33pF,50V
	C33	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C34	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C35	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C36	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C37	QETC1AM-476	E CAPACITOR	47μF,10V
	C38	QEN61CM-106	NP E CAPACITOR	10μF,16V
		or QENC1CM-106	NP E CAPACITOR	10μF,16V
	C39	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C41	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C201	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C202	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C203	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C204	QCFA1HZ-223	CAPACITOR	0.022μF,50V
	C205	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C206	QCF81EZ-224	CAPACITOR	0.22μF,25V
	C207	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C208	QETC1EM-335	E CAPACITOR	3.3μF,25V
	C209	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C210	QETC0JM-337	E CAPACITOR	330μF,6.3V
	C211	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C212	QCSA1HJ-101	CAPACITOR	100pF,50V
	C213	QCSA1HJ-680	CAPACITOR	68pF,50V
	C214	QCSA1HG-360	CAPACITOR	36pF,50V
	C215	QCSA1HJ-221	CAPACITOR	220pF,50V
	C216	QCFA1HZ-473	CAPACITOR	0.047μF,50V
	C217	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C218	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C219	QETC1HM-474	E CAPACITOR	0.47μF,50V
	C220	QCBB1HJ-102	CAPACITOR	0.001μF,50V
	C221	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C222	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C223	QETC1HM-224	E CAPACITOR	0.22μF,50V
	C224	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C225	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C226	QCFB1EZ-223	CAPACITOR	0.022μF,25V
	C227	QETC1HM-104	E CAPACITOR	0.1μF,50V
	C228	QETC1EM-475	E CAPACITOR	4.7μF,25V
	C229	QCYA1HK-332	CAPACITOR	0.0033μF,50V
	C230	QETC1HM-105	E CAPACITOR	1μF,50V
	C232	QCYA1EJ-103	CAPACITOR	0.01μF,25V
	L1	PU59988-121JY	COIL	120μH
	L2	PU59988-470JY	COIL	47μH
	L3	PU59988-390JY	COIL	39μH
	L4	PU59988-221JY	COIL	220μH
	L5	PU59988-330JY	COIL	33μH
	L6	PU59988-820JY	COIL	82μH
	L7	PU48530-271J	COIL	270μH
	L8	PU48530-101K	COIL	100μH
	L9	PU59988-680JY	COIL	68μH
	L10	PU59988-680JY	COIL	68μH
	L11	PU59153-101K	COIL	100μH
	L12	PU59988-680JY	COIL	68μH
	L13	PU59988-R22KY	COIL	0.22μH
	L14	PU59988-R22KY	COIL	0.22μH
	L201	PU59153-101K	COIL	100μH
	L202	PU48530-222J	COIL	2.2mH
	L203	PU60165-150G	COIL	15μH
	L204	PU48530-561J	COIL	560μH
	EQ1	PU60056-2	EQUALIZER	
		or PU60056	EQUALIZER	
	LPF1	PU60632	LOW PASS FILTER	
	LPF2	PU60055	LOW PASS FILTER	
	LPF201	PU60128-2	LOW PASS FILTER	
	BPF201	PU60631	BAND PASS FILTER	
	CF201	PU58852	CERAMIC FILTER	
	DL201	PU60058-2	DELAY LINE	
		or PU6C322	DELAY LINE	
		or PU60058	DELAY LINE	
⚠	X201	PU60059	CRYSTAL RESONATOR	
	T201	PU60057-3	TANK FILTER	
		or PU60057-2	TANK FILTER	
	SLD1	PU61177	SHIELD CASE	
	SLD2	PU61178	SHIELD PLATE	
	CN1	PEMC0712-113	PIN HEADER	
	CN2	PEMC0712-114	PIN HEADER	
	CN3	PEMC0712-111	PIN HEADER	

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AUDIO UNIT BOARD ASSEMBLY <09>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10298C	AUDIO UNIT BOARD ASSEMBLY	
	IC1	PB20167B-01	FMA MODULE BOARD ASSY	
	IC2	SN74HCU04N	IC	
		or BU74HCU04	IC	
	Q1	2SC4081(QR)	TRANSISTOR	
	Q2	2SC4081(QR)	TRANSISTOR	
	Q4	2SC4081(QR)	TRANSISTOR	
	Q6	2SC4097(QR)	TRANSISTOR	
	Q7	2SC4081(QR)	TRANSISTOR	
	Q10	DTA114EU	TRANSISTOR	
	Q11	DTC114EU	TRANSISTOR	
	Q12	DTC143TU	TRANSISTOR	
	Q13	DTA113ZU	TRANSISTOR	
	Q14	2SC4097(QR)	TRANSISTOR	
	Q15	2SA1577(QR)	TRANSISTOR	
	Q16	DTC124EU	TRANSISTOR	
	Q17	2SC4081(QR)	TRANSISTOR	
	Q18	2SC1740S(RS)	TRANSISTOR	
	Q19	2SD1450S,T	TRANSISTOR	
	Q20	2SD1450S,T	TRANSISTOR	
	Q21	DTA114EU	TRANSISTOR	
	D1	1SS133	DIODE	
	D3	DAP202U	DIODE	
	D5	1SS133	DIODE	
	D6	1SS133	DIODE	
	D7	1SS133	DIODE	
	D8	1SS133	DIODE	
	D9	1SS133	DIODE	
	D14	1SS133	DIODE	
	D19	DAN202U	DIODE	
	D20	1SS133	DIODE	
	R1	QRSA08J-151YN	RESISTOR	150Ω,1/10W
	R2	QRSA08J-151YN	RESISTOR	150Ω,1/10W
	R3	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R4	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R5	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R6	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R7	QRSA08J-243YN	RESISTOR	24kΩ,1/10W
	R8	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R9	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R10	QRSA08J-183YN	RESISTOR	18kΩ,1/10W
	R11	QRSA08J-473YN	RESISTOR	47kΩ,1/10W
	R12	QRSA08J-274YN	RESISTOR	270kΩ,1/10W
	R13	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R14	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R15	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R16	QRSA08J-392YN	RESISTOR	3.9kΩ,1/10W

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	R17	QRSA08J-0R0YN	RESISTOR	0Ω,1/10W
	R18	QRSA08J-183YN	RESISTOR	18kΩ,1/10W
	R19	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R20	QRSA08J-0R0YN	RESISTOR	0Ω,1/10W
	R21	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R22	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R23	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
	R24	QRSA08J-6R8YN	RESISTOR	6.8Ω,1/10W
	R25	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R26	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R27	QRSA08J-472YN	RESISTOR	4.7kΩ,1/10W
	R28	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R29	QRSA08J-152	RESISTOR	1.5kΩ,1/10W
	R34	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R35	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R36	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R37	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R39	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R40	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R41	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R42	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R43	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R45	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R46	QRSA08J-132YN	RESISTOR	1kΩ,1/10W
	R47	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R50	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R51	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R52	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R53	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R55	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R56	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R57	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R58	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R59	QRSA08J-682YN	RESISTOR	6.8kΩ,1/10W
	R60	QRSA08J-152YN	RESISTOR	1.5kΩ,1/10W
	R61	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R63	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R64	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R65	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R66	QRSA08J-561YN	RESISTOR	560Ω,1/10W
	R67	QRSA08J-561YN	RESISTOR	560Ω,1/10W
	R68	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R69	QRSA08J-0R0YN	RESISTOR	0Ω,1/10W
	R70	QRSA08J-0R0YN	RESISTOR	0Ω,1/10W
	R71	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R72	QRSA08J-563YN	RESISTOR	56kΩ,1/10W
	R73	QRSA08J-563YN	RESISTOR	56kΩ,1/10W
	R75	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R76	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R79	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R80	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R81	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
	R82	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R83	QRD161J-102	RESISTOR	1kΩ,1/6W
	C1	QEK61CM-106	E CAPACITOR	10μF,16V
	C2	QEK61CM-106	E CAPACITOR	10μF,16V
	C4	QEK61HM-225	E CAPACITOR	2.2μF,50V
	C5	QEK61CM-106	E CAPACITOR	10μF,16V
	C6	QEK61CM-106	E CAPACITOR	10μF,16V
	C7	QEK61CM-106	E CAPACITOR	10μF,16V
	C8	QEK61CM-476	E CAPACITOR	47μF,16V
	C9	QEK61CM-106	E CAPACITOR	10μF,16V
	C10	QEK60JM-336	E CAPACITOR	33μF,6.3V
	C11	QEK60JM-336	E CAPACITOR	33μF,6.3V
	C12	QEK61CM-106	E CAPACITOR	10μF,16V
	C13	QEB61CM-685	E CAPACITOR	6.8μF,16V
	C14	PU60550-105	E CAPACITOR	1μF,50V
	C15	QCSA1HJ-561	CAPACITOR	560pF,50V
	C16	QCYA1HK-332	CAPACITOR	0.0033μF,50V
	C17	QCYA1HK-123	CAPACITOR	0.012μF,50V
	C18	QCSA1HJ-471	CAPACITOR	470pF,50V
	C19	QEK61CM-106	E CAPACITOR	10μF,16V
	C20	QCYA1HK-123	CAPACITOR	0.012μF,50V
	C21	QEK61HM-105	E CAPACITOR	1μF,50V
	C22	NCR21CK-563A	CAPACITOR	0.056μF,16V
	C23	QFV71HJ-184	TF CAPACITOR	0.18μF,50V
	C24	QCSA1HJ-331	CAPACITOR	330pF,50V
	C25	QFV71HJ-473	TF CAPACITOR	0.047μF,50V
	C26	QCYA1HK-272	CAPACITOR	0.0027μF,50V
	C27	QEK61HM-475	E CAPACITOR	4.7μF,50V
	C28	QCYA1HK-392	CAPACITOR	0.0039μF,50V
	C29	QEK60JM-476	E CAPACITOR	47μF,6.3V
	C30	QEK61AM-336	E CAPACITOR	33μF,10V
	C31	QEK61HM-225	E CAPACITOR	2.2μF,50V
	C36	QEK61CM-476	E CAPACITOR	47μF,16V
	C37	QFV81HJ-224	TF CAPACITOR	0.22μF,50V
	C38	QFV71HJ-474	TF CAPACITOR	0.47μF,50V
	C45	QEK61CM-106	E CAPACITOR	10μF,16V
	C46	QEK61CM-106	E CAPACITOR	10μF,16V
	C47	QETB1AM-476	E CAPACITOR	47μF,10V
	C48	QEP61CM-106	NP E CAPACITOR	10μF,16V
	C49	QEK61CM-106	E CAPACITOR	10μF,16V
	C51	QEK61HM-225	E CAPACITOR	2.2μF,50V
	C52	QEK61AM-336	E CAPACITOR	33μF,10V
	C53	QEK61CM-476	E CAPACITOR	47μF,16V
	C54	QCYA1HK-102	CAPACITOR	0.001μF,50V
	C55	QEK61AM-336	E CAPACITOR	33μF,10V
	C56	QETB0JM-107	E CAPACITOR	100μF,6.3V
	C57	PU59499	BUS WIRE	
	C58	QEK61CM-106	E CAPACITOR	10μF,16V
	C59	QEP61CM-106	NP E CAPACITOR	10μF,16V
	C60	QETC1AM-476	E CAPACITOR	47μF,10V
	C61	QEK61CM-106	E CAPACITOR	10μF,16V
	C62	QEK60JM-476	E CAPACITOR	47μF,6.3V
	C64	QEK61CM-476	E CAPACITOR	47μF,16V
	C65	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C66	QEK61CM-476	E CAPACITOR	47μF,16V
	L1	PU58308-222J	COIL	2.2mH
	L2	PU48530-101J	COIL	100μH
	L3	PU48530-101J	COIL	100μH
	L4	PU53618-101J	COIL	100μH
	BPF1	PU60396	BAND PASS FILTER	
	BPF2	PU60397	BAND PASS FILTER	
⚠	T1	PU60510	OSC TRANSFORMER	
	CN1	PEMC0712-104	PIN HEADER	
	CN2	PEMC0712-115	PIN HEADER	
	CN3	PEMC0712-114	PIN HEADER	
	CN4	PEMC0712-111	PIN HEADER	

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AUDIO/CTL HEAD BOARD <12>

REF. No.	PART No.	PART NAME, DESCRIPTION
PWB1	PB40068	A/CTL HEAD PWB
CN1	PU58844-107	CAP HOUSING

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DEMODULATOR BOARD ASSEMBLY <14>

REF. No.	PART No.	PART NAME, DESCRIPTION	
PWBA1	PB20453A-01	DEMODULATOR BOARD ASSEMBLY	
IC501	UPC1870CA	IC	
Q501	2SD1450S,T	TRANSISTOR	
Q512	2SD1450S,T	TRANSISTOR	
R501	QVZ3531-103	V RESISTOR,SAP BPF	
R502	QVZ3531-473	V RESISTOR,VCO	
R503	QVZ3531-473	V RESISTOR,LPF	
R504	QVZ3518-683AZ	V RESISTOR,SEPARATION	
R505	QVZ3518-104AZ	V RESISTOR,SEPARATION	
R506	QVZ3518-472AZ	V RESISTOR,SAP LEVEL	
R507	QVZ3518-102AZ	V RESISTOR,L.LEVEL	
R508	QVZ3518-102AZ	V RESISTOR,R.LEVEL	
R511	QRSA08J-153	RESISTOR	15kΩ,1/10W
R512	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
R513	QRV144F-1002AY	CMF RESISTOR	10kΩ,1/4W
R515	QRV144F-7502AY	RESISTOR	75kΩ,1/4W
R516	QRV144F-5493AY	RESISTOR	549kΩ,1/4W
R517	QRSA08J-563YN	RESISTOR	56kΩ,1/10W
R518	QRSA08J-124YN	RESISTOR	120kΩ,1/10W
R519	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
R520	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
R521	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R522	QRSA08J-303YN	RESISTOR	30kΩ,1/10W
R523	QRV144F-8202AY	RESISTOR	82kΩ,1/4W
R524	QRSA08J-102	RESISTOR	1kΩ,1/10W
R535	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
R536	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
R537	QRSA08J-102	RESISTOR	1kΩ,1/10W
R538	QRSA08J-102	RESISTOR	1kΩ,1/10W
R550	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R552	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
R554	QRD161J-271	RESISTOR	270Ω,1/6W
C501	QETC1CM-107	E CAPACITOR	100μF,16V
C502	QEK61CM-106	E CAPACITOR	10μF,16V
C503	QFV71HJ-154	TF CAPACITOR	0.15μF,50V
C504	QCBB1HJ-102	CAPACITOR	0.001μF,50V
C505	QFV71HJ-104	TF CAPACITOR	0.1μF,50V
C506	QEK61HM-474	E CAPACITOR	0.47μF,50V
C507	QEK61CM-106	E CAPACITOR	10μF,16V
C509	QEK61HM-474	E CAPACITOR	0.47μF,50V
C510	QEK61HM-474	E CAPACITOR	0.47μF,50V
C511	QEK61HM-474	E CAPACITOR	0.47μF,50V
C512	QEE81CJ-335	TANTAL CAPACITOR	3.3μF,16V
C513	QEE81VJ-105	TANTAL CAPACITOR	1μF,35V
C514	QFV71HJ-104	TF CAPACITOR	0.1μF,50V
C515	QEK61CM-106	E CAPACITOR	10μF,16V
C516	QEK61CM-106	E CAPACITOR	10μF,16V
C517	QEK61HM-225	E CAPACITOR	2.2μF,50V
C518	QEK61HM-105	E CAPACITOR	1μF,50V
C519	QEK61HM-475	E CAPACITOR	4.7μF,50V
C520	QETC1CM-107	E CAPACITOR	100μF,16V
C521	QEK61CM-226	E CAPACITOR	22μF,16V
C522	QFV71HJ-223	TF CAPACITOR	0.022μF,50V
C523	QEK61HM-105	E CAPACITOR	1μF,50V
C537	QEK61CM-106	E CAPACITOR	10μF,16V
C538	QEK61CM-106	E CAPACITOR	10μF,16V
C539	QFV71HJ-123	TF CAPACITOR	0.012μF,50V
C540	QFV71HJ-123	TF CAPACITOR	0.012μF,50V
C541	QCVB1CN-103	CAPACITOR	0.01μF,16V
C542	QETC1CM-107	E CAPACITOR	100μF,16V
L501	PU60211	LOW PASS FILTER	
L502	PU60211	LOW PASS FILTER	
SPC501	PU59210-003	W.LOKING SPACER,X4	
CN501	PU58844-3	CAP HOUSING	
CN502	PU58844-10	CAP HOUSING	

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ON SCREEN BOARD ASSEMBLY <17>

REF. No.	PART No.	PART NAME, DESCRIPTION
PWBA5	PB10380A5-02	ON SCREEN BOARD ASSEMBLY
IC901	M50554-168SP	IC
IC951	M52684AP	IC
Q901	DTA114EU	TRANSISTOR
Q902	DTA114EU	TRANSISTOR
Q903	2SA1576(RS)	TRANSISTOR
Q904	2SC4081(RS)	TRANSISTOR
Q905	2SA1576(RS)	TRANSISTOR
Q906	DTC114EU	TRANSISTOR
Q971	DTC114EU	TRANSISTOR
Q972	2SC4081(RS)	TRANSISTOR
Q973	2SK665	TRANSISTOR

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	Q974	DTC144EU	TRANSISTOR	
	D971	DAP202U	DIODE	
	R901	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R902	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R903	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R904	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R905	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R906	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R907	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R908	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R909	QRSA08J-392	RESISTOR	2.7kΩ,1/10W
	R911	QRSA08J-682	RESISTOR	15kΩ,1/10W
	R912	QRSA08J-392YN	RESISTOR	3.9kΩ,1/10W
	R916	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R917	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
	R918	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R919	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R921	QRSA08J-221YN	RESISTOR	220Ω,1/10W
	R924	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R926	QRSA08J-182YN	RESISTOR	1.8kΩ,1/10W
	R930	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R931	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R932	QRSA08J-222	RESISTOR	2.2kΩ,1/10W
	R933	QRSA08J-0R0YN	RESISTOR	0Ω,1/10W
	R941	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R942	QRD161J-103	RESISTOR	10kΩ,1/6W
	R952	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R953	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R954	QRSA08J-152	RESISTOR	1.5kΩ,1/10W
	R955-	QRSA08J-154YN	RESISTOR	150kΩ,1/10W
	R956	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R971	QRSA08J-123YN	RESISTOR	12kΩ,1/10W
	R972	QRSA08J-563YN	RESISTOR	56kΩ,1/10W
	R973	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R974	QRSA08J-563YN	RESISTOR	56kΩ,1/10W
	R975	QRSA08J-0R0YN	RESISTOR	0Ω,1/10W
	C901	QETC0JM-476	E CAPACITOR	47μF,6.3V
	C902	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C903	QEK61CM-106	E CAPACITOR	10μF,16V
	C904	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C905	QAT3123-450	TRIMMER CAPACITOR, DOT CLOCK	45pF
	C906	QCTA1CH-330	CAPACITOR	33pF,16V
	C907	QCTA1CH-470	CAPACITOR	47pF,16V
	C909	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C910	QCTA1CH-270	CAPACITOR	27pF,16V
	C911	QEP41HM-105	NP E CAPACITOR	1μF,50V
	C912	QCSA1HJ-270	CAPACITOR	27pF,50V
	C915	QCTA1CH-220	CAPACITOR	22pF,16V
	C916	QAT3123-300	TRIMMER CAPACITOR, DOT CLOCK	30pF
	C921	QCTA1CH-181	CAPACITOR	180pF,16V
	C922	QCTA1CH-101	CAPACITOR	100pF,16V
	C923	QCTA1CH-560	CAPACITOR	56pF,16V
	C924	QCSA1HJ-560	CAPACITOR	56pF,50V
	C951	QFN31HJ-562	M CAPACITOR	0.0056μF,50V
	C952	QCTA1CH-220	CAPACITOR	22pF,16V
	C953	QCFA1HZ-152	CAPACITOR	0.0015μF,50V
	C954	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C955	QEK61HM-105	E CAPACITOR	1μF,50V
	C956	QEK61CM-106	E CAPACITOR	10μF,16V
	C957	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C959	QEK61HM-335	E CAPACITOR	3.3μF,50V
	C971	QEK61HM-334	E CAPACITOR	0.33μF,50V
	L901	PU54223-101K	COIL	100μH
	L902	PU58333-220J	COIL	22μH
	L905	PU59152-220J	COIL	22μH
	L906	PU59152-220J	COIL	22μH
⚠	CF951	PU60086	RESONATOR	
⚠	X901	PU60747	CRYSTAL RESONATOR	
	CN901	PEMC0713-111	HOUSING	
	CN902	PEMC0714-011	CAP HOUSING	

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TIMER/DISPLAY/SW BOARD ASSEMBLY <21>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA2	PB10380A2-02	T/D/S BOARD ASSEMBLY	
	IC701	HD404729RY03S	IC(MCU)	
	or	HD4074729S9Y03	IC	
	IC702	CAT93C46P	IC	
	or	93C46/P	IC	
	IC703	GP1U541X	INFRARED RAYS UNIT	
	IC704	MSC1198SS	IC	
	Q701	2SC3311A(RS)	TRANSISTOR	
	or	2SC1740S(RS)	TRANSISTOR	
	or	2SC3199(GB)-TJK	TRANSISTOR	
	or	2SC536SPA(FG)	TRANSISTOR	
	Q706	2SC3311A(RS)	TRANSISTOR	
	or	2SC1740S(RS)	TRANSISTOR	
	or	2SC536SPA(FG)	TRANSISTOR	
	or	2SC3199(GB)-TJK	TRANSISTOR	
	Q709	DTC124EU	TRANSISTOR	
	Q751	DTC124ES	TRANSISTOR	
	or	2SC3400	TRANSISTOR	
	Q752	DTC124ES	TRANSISTOR	
	Q753	DTC124ES	TRANSISTOR	
	Q754	DTA124EU	TRANSISTOR	
	D701	1SS133	DIODE	
	or	MA165	DIODE	
	D702	11ES2	DIODE	
	D703	LTZ-MR15	DIODE	
	D704	1SS133	DIODE	
	or	MA165	DIODE	
	D705	UZ9.1BSB	ZENER DIODE	
	or	RD9.1ESB2	ZENER DIODE	
	or	HZS9.1EB2TJ	ZENER DIODE	
	D707	11ES2	DIODE	
	D710	1SS133	DIODE	
	or	MA165	DIODE	
	D711	1SS132	DIODE	
	D712	1SS132	DIODE	
	D713	1SS132	DIODE	
	D714	1SS132	DIODE	
	D715	1SS132	DIODE	
	D716	1SS132	DIODE	
	D717	1SS132	DIODE	
	D718	1SS132	DIODE	
	D720	SLH-34VC3F	LE DIODE,SAP REC	
	D721	1SS133	DIODE	
	D772	SLH-34MC3F	LE DIODE,AUTO TRACKING	
	D775	SLH-34MC3F	LE DIODE,SAP	
	D777	SLH-34VC3F	LE DIODE,STEREO	
	R701	QRD161J-333	RESISTOR	33kΩ,1/6W
	R702	QRD161J-123	RESISTOR	12kΩ,1/6W
	R703	QRD161J-104	RESISTOR	100kΩ,1/6W
	R704	QRD161J-682	RESISTOR	6.8kΩ,1/6W
	R705	QRD161J-103	RESISTOR	10kΩ,1/6W
	R706	QRD161J-103	RESISTOR	10kΩ,1/6W
	R707	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R708	QRD161J-224	RESISTOR	220kΩ,1/6W
	R709	QRD161J-103	RESISTOR	10kΩ,1/6W
	R710	QRD161J-103	RESISTOR	10kΩ,1/6W
	R711	QRD161J-103	RESISTOR	10kΩ,1/6W
	R712	QRD161J-103	RESISTOR	10kΩ,1/6W
	R714	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R715	QRSA08J-271YN	RESISTOR	270Ω,1/10W
	R717	QRSA08J-105YN	RESISTOR	1MΩ,1/10W
	R725	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R726	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R727	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R728	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R729	QRD161J-271	RESISTOR	270Ω,1/6W
	R730	QRSA08J-151YN	RESISTOR	150Ω,1/10W
	R731	QRSA08J-104	RESISTOR	100kΩ,1/10W
	R732	QRD161J-103	RESISTOR	10kΩ,1/6W
	R733	QRD161J-103	RESISTOR	10kΩ,1/6W
	R734	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R735	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R736	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R737	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R738	QRD161J-103	RESISTOR	10kΩ,1/6W
	R739	QRSA08J-102	RESISTOR	1kΩ,1/10W
	R740	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R741	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R742	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R743	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R744	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	R745	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R746	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R747	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R749	QRSA08J-333YN	RESISTOR	33kΩ,1/10W
	R756	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R757	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R758	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R759	QRSA08J-153	RESISTOR	15kΩ,1/10W
	R761	QRSA08J-104	RESISTOR	100kΩ,1/10W
	R765	QRSA08J-104	RESISTOR	100kΩ,1/10W
	R768	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R769	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R770	QRSA08J-472	RESISTOR	4.7kΩ,1/10W
	RA701	QRB047J-333	RESISTOR ARRAY	
	or	QRB049J-333	RARRAY	
	RA702	QRB157J-104	RESISTOR ARRAY	
	or	QRB159J-104	RESISTOR ARRAY	
	RA703	QRB117J-104	NETWORK RESISTOR	
	or	QRB119J-104	NETWORK RESISTOR	
	C701	PU57601-335MC	E CAPACITOR	3.3μF
	C702	QEK61CM-226	E CAPACITOR	22μF,16V
	C703	QEA40HZ-104	E CAPACITOR (DOUBLE)	0.1μF,50H
	or	QEA40HZ-104A	E CAPACITOR (DOUBLE)	0.1μF,50H
	C704	QEK61CM-106	E CAPACITOR	10μF,16V
	C705	QCFA1HZ-102	CAPACITOR	0.001μF,50V
	C706	QCFA1HZ-473	CAPACITOR	0.047μF,50V
	C707	QCFA1HZ-473	CAPACITOR	0.047μF,50V
	C710	QCSA1HJ-101	CAPACITOR	100pF,50V
	C711	QCSA1HJ-101	CAPACITOR	100pF,50V
	C712	QAT3123-200	TRIMMER CAPACITOR, CLOCK ADJ	20pF
	C713	QCSA1HJ-100	CAPACITOR	10pF,50V
	C714	QCSA1HJ-560	CAPACITOR	56pF,50V
	C715	QEK61CM-106	E CAPACITOR	10μF,16V
	C716	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C751	QEK61CM-106	E CAPACITOR	10μF,16V
	C752	QEK60JM-226	E CAPACITOR	22μF,6.3V
	C753	QEK60JM-226	E CAPACITOR	22μF,6.3V
	C754	QCFA1HZ-223	CAPACITOR	0.022μF,50V
	C755	QCFA1HZ-223	CAPACITOR	0.022μF,50V
	C758	QEK60JM-107	E CAPACITOR	100μF,6.3V
	C759	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C760	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C762	QEK61VM-226	E CAPACITOR	22μF,35V
	C767	QEK61HM-106	E CAPACITOR	10μF,50V
	L701	PU48530-101J	COIL	100μH
	L751	PU48530-101J	COIL	100μH
⚠	X701	PU61013	CRYSTAL RESONATOR	
	S702	PU60392-2Z	TACT SWITCH,STOP/EJECT	
	S703	PU60392-2Z	TACT SWITCH,FF	
	S704	PU60392-2Z	TACT SWITCH,REW	
	S705	PU60392-Z	TACT SWITCH,TV/VIDEO	
	S706	PU60392-Z	TACT SWITCH,REC/OTR	
	S707	PU60392-2Z	TACT SWITCH,PLAY	
	S708	PU60392-2Z	TACT SWITCH,PAUSE	
	S718	PU60392-Z	TACT SWITCH,MENU	
	S719	PU60392-Z	TACT SWITCH,START	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	S721	PU60392-Z	TACT SWITCH,CANCEL/SKIP/RESET	
	S722	PU60392-Z	TACT SWITCH,REPEAT/ADD/C.MEMO	
	S723	PU60392-Z	TACT SWITCH,SELECT	
	S724	PU60392-Z	TACT SWITCH,TIMER	
	S727	PU60392-Z	TACT SWITCH,SP/EP	
	S729	PU60392-Z	TACT SWITCH,CH+/SET+	
	S730	PU60392-Z	TACT SWITCH,CH-/SET-	
	S732	PU60392-Z	TACT SWITCH,DISPLAY	
	S781	PU59292	SLIDE SWITCH,EDIT	
	S782	PU59292	SLIDE SWITCH,AC ONLINE	
	FDP1	PU61084-2	FLUORESCENT DISPLAY PANEL	
	HD1	PQ32933-1-1	FDP HOLDER(L)	
	HD2	PQ32934-1-1	FDP HOLDER(R)	
	HD701	PQM30038-2-2	LED HOLDER	
	CN701	PU61044-6	WIRE TRAP	
	CN702	PU58844-2	CAP HOUSING	
	CN703	PU59555-10	CAP HOUSING	
	CN705	PU59555-9	CAP HOUSING	
	CN706	PEMC0723-006	B TO B CONN	

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SW/JACK BOARD ASSEMBLY <37>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA3	PB10380A3-02	SW/JACK BOARD ASSEMBLY	
	Q752	DTC124ES	TRANSISTOR	
		or 2SC3400	TRANSISTOR	
	D778	SLH-34VC3F	LE DIODE,POWER	
	R781	QRD161J-103	RESISTOR	10kΩ,1/6W
	R782	PU60884	V RESISTOR,P.SHARP	
	R783	PU60885	V RESISTOR,HEADPHONE LEVEL	
	R785	QRD161J-331	RESISTOR	330Ω,1/6W
	S701	PU60392-2Z	TACT SWITCH,POWER	
	HD1	PQM30038-1-2	LED HOLDER	
	JA704	PU60452-2	MINI JACK,HEADPHONE	
	CN751	PU59555-6	CAP HOUSING	
	CN752	PEMC0724-006	B TO B CONN	

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UPPER DRUM BOARD <41>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION
	PWB1	PDM3017	BOARD (UPPER DRUM)

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PRE/REC BOARD ASSEMBLY <43>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10330A-01	PRE/REC BOARD ASSEMBLY	
	IC1	AN3380NK	IC	
	IC201	AN3386NK-A	IC	
	Q1	DTC124TU	TRANSISTOR	
	Q2	DTC124TU	TRANSISTOR	
	Q4	2SC4081(QRS)	TRANSISTOR	
	Q5	DTC124TU	TRANSISTOR	
	Q201	2SA1576(QRS)	TRANSISTOR	
	Q202	2SC4081(QRS)	TRANSISTOR	
	Q203	2SC4081(QRS)	TRANSISTOR	
	Q204	DTC144WU	TRANSISTOR	
	Q205	DTC144WU	TRANSISTOR	
	Q206	DTC144WU	TRANSISTOR	
	D1	1SS133	DIODE	
		or MA165	DIODE	
	D2	1SS133	DIODE	
		or MA165	DIODE	
	D201	1SS133	DIODE	
		or MA165	DIODE	
	D202	1SS133	DIODE	
		or MA165	DIODE	
	D203	MA141K	DIODE	
	R1	QRSA08J-273YN	RESISTOR	27kΩ,1/10W
	R2	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R3	QRSA08J-101YN	RESISTOR	100Ω,1/10W
	R4	QRSA08J-274YN	RESISTOR	270kΩ,1/10W
	R5	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R6	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R7	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R8	QRSA08J-332YN	RESISTOR	3.3kΩ,1/10W
	R9	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
	R10	QRSA08J-223YN	RESISTOR	22kΩ,1/10W
	R11	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R12	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R13	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R14	QRSA08J-560YN	RESISTOR	56Ω,1/10W
	R15	QRSA08J-560YN	RESISTOR	56Ω,1/10W
	R201	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R202	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R203	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R204	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R205	QRSA08J-391YN	RESISTOR	390Ω,1/10W
	R206	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R207	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R208	QRSA08J-222YN	RESISTOR	2.2kΩ,1/10W
	R209	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R210	QRSA08J-681YN	RESISTOR	680Ω,1/10W
	R211	QRSA08J-561YN	RESISTOR	560Ω,1/10W
	R212	QRSA08J-821YN	RESISTOR	820Ω,1/10W
	R213	QRSA08J-102YN	RESISTOR	1kΩ,1/10W
	R214	QRSA08J-122YN	RESISTOR	1.2kΩ,1/10W
	R215	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R216	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
	R217	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R218	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R219	QRSA08J-334YN	RESISTOR	330kΩ,1/10W
	R220	QRSA08J-103YN	RESISTOR	10kΩ,1/10W
	R221	QRSA08J-393YN	RESISTOR	39kΩ,1/10W
	R222	QRSA08J-153YN	RESISTOR	15kΩ,1/10W
	R223	NRVA02D-4872AY	RESISTOR	48.7kΩ,1/10W
	R224	QRSA08J-474YN	RESISTOR	470kΩ,1/10W
	R225	QRSA08J-562YN	RESISTOR	5.6kΩ,1/10W
	R226	QRSA08J-431YN	RESISTOR	430Ω,1/10W
	R227	QRSA08J-471YN	RESISTOR	470Ω,1/10W
	R228	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R229	QRSA08J-331YN	RESISTOR	330Ω,1/10W
	R230	QRSA08J-104YN	RESISTOR	100kΩ,1/10W
	R231	QRS188J-474YN	RESISTOR	470kΩ,1/8W
	C1	QER61HM-104	E CAPACITOR	0.1μF,50V
	C2	QCSA1HJ-391	CAPACITOR	390pF,50V
	C3	QCSA1HJ-561	CAPACITOR	560pF,50V
	C4	QCSA1HJ-102	CAPACITOR	0.001μF,50V
	C5	QCSA1HJ-561	CAPACITOR	560pF,50V
	C6	QCSA1HJ-102	CAPACITOR	0.001μF,50V
	C7	QCFA1CZ-224	CAPACITOR	0.22μF,16V
	C8	QCSA1HJ-391	CAPACITOR	390pF,50V
	C9	QER60JM-107	E CAPACITOR	100μF,6.3V
	C10	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C11	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C12	QCFA1CZ-224	CAPACITOR	0.22μF,16V
	C14	QCSA1HJ-330	CAPACITOR	33pF,50V
	C15	QCSA1HJ-331	CAPACITOR	330pF,50V
	C16	QCSA1HJ-101	CAPACITOR	100pF,50V
	C17	QCSA1HJ-102	CAPACITOR	0.001μF,50V
	C18	QCSA1HJ-102	CAPACITOR	0.001μF,50V
	C19	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C201	QER60JM-476	E CAPACITOR	47μF,6.3V
	C202	QCFA1HZ-473	CAPACITOR	0.047μF,50V
	C203	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C204	QCSB1HK-4R7	CAPACITOR	4.7μF,50V
	C205	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C207	QCSA1HJ-360	CAPACITOR	36pF,50V
	C208	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C209	QCSA1HJ-101	CAPACITOR	100pF,50V
	C210	QCSA1HJ-331	CAPACITOR	330pF,50V
	C211	QCSA1HJ-680	CAPACITOR	68pF,50V
	C212	QCSA1HJ-101	CAPACITOR	100pF,50V
	C213	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C214	QCSA1HJ-391	CAPACITOR	390pF,50V
	C216	QER61CM-476	E CAPACITOR	47μF,16V
	C217	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C218	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C219	QCFA1EZ-104	CAPACITOR	0.1μF,25V
	C220	QCSA1HJ-221	CAPACITOR	220pF,50V
	C221	QCSA1HJ-271	CAPACITOR	270pF,50V
	C222	QCSA1HJ-151	CAPACITOR	150pF,50V
	C223	QCSA1HJ-151	CAPACITOR	150pF,50V
	C224	QCY81EK-104	CAPACITOR	0.1μF,25V
	C225	QCY81EK-104	CAPACITOR	0.1μF,25V
	C226	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C227	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C228	QCY81EK-104	CAPACITOR	0.1μF,25V
	C229	QCY81EK-104	CAPACITOR	0.1μF,25V
	C230	QER61AM-685	E CAPACITOR	6.8μF,10V
	C231	QCF81EZ-224	CAPACITOR	0.22μF,25V
	C232	QCFA1HZ-103	CAPACITOR	0.01μF,50V
	C233	QCVB1CN-103	CAPACITOR	0.01μF,16V
	L1	PU54223-101K	COIL	100μH
	L2	PU53223-221J	COIL	220μH
	L201	PU54223-101K	COIL	100μH
	L202	PU59988-270JY	COIL	27μH
	L203	PU59988-330JY	COIL	33μH
	L204	PU59988-560JY	COIL	56μH
	L205	PU59988-100JY	COIL	10μH
	L206	PU59988-181JY	COIL	180μH
	L207	PU59988-180JY	COIL	18μH
	L208	PU54223-470K	COIL	47μH
	SLD201	PQ33001-1-1	SHIELD CASE(1)	
	CN1	PU58844-104	CAP HOUSING	
	CN201	PU59555-108	CAP HOUSING	
	CN202	PU58844-106	CAP HOUSING	
	CN203	PU59974-11	CAP HOUSING	

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DECK TERMINAL BOARD ASSEMBLY <51>

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	
	PWBA	PB10320A-02	DECK TERM. BOARD ASSEMBLY	
	Q1	PU60625	END SENSOR	
	R1	QRD161J-202	RESISTOR	2kΩ,1/6W
	R3	QRD161J-331	RESISTOR	330Ω,1/6W
	R4	QRD161J-331	RESISTOR	330Ω,1/6W
	R5	QRD161J-331	RESISTOR	330Ω,1/6W
	R7	QRD161J-202	RESISTOR	2kΩ,1/6W
	R8	NTH5D473KB	THERMISTOR	47kΩ
		or ERT-D2ZHK473S	NEGA THERMISTOR	47kΩ
	C1	QCVB1CM-103	CAPACITOR	0.01μF,16V
	PHS1	PS5705HR	PH INTERRUPTER(TU REEL)	
	PHS2	PS5705HR	PH INTERRUPTER(SUP REEL)	
	CN1	PEMC0722-017	WIRE TRAP	
		or PEMC0753-017	WIRE TRAP	
	CN2	PU60642	7PIN CONNECTOR	
	CN3	PU60640	4PIN CONNECTOR	

⚠	REF. No.	PART No.	PART NAME, DESCRIPTION	

LOADING MDA BOARD ASSEMBLY <55>

	PWBA2	PB10320A2-01	LOADING MDA BOARD ASSY	
⚠	IC1	BA6418N	IC	
⚠		or XRA6418N	IC	
	C1	QETA1CM-336	E CAPACITOR	33μF,16V
	CN1	PU59555-104	CAP HOUSING	

CASSETTE HOUSING BOARD <56>

	PWB1	PB40041-01-01	CASSETTE HOUSING BOARD	
	Q2	PN268VI-NC	PHOTO TRANSISTOR	
	C1	QCC11EJ-103	CAPACITOR	0.01μF,25V
	PHS3	PU60629	CASS.SENSOR	
	CN2	PU60639	CONNECTOR(4PIN)	

AUTO TRACKING BOARD ASSEMBLY <83>

	PWBA4	PB10380A4-02	AUTO TRACKING BOARD ASSEMBLY	
	IC451	BA7039	IC	
	R451	QRD161J-102	RESISTOR	1kΩ,1/6W
	R452	QRD161J-102	RESISTOR	1kΩ,1/6W
	R453	QRD161J-102	RESISTOR	1kΩ,1/6W
	R455	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R456	QRD161J-102	RESISTOR	1kΩ,1/6W
	R458	QRD161J-124	RESISTOR	120kΩ,1/6W
	R460	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	R461	QRD161J-472	RESISTOR	4.7kΩ,1/6W
	C451	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C452	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C453	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C454	QFV71HJ-104	TF CAPACITOR	0.1μF,50V
		or QFN31HJ-104	M CAPACITOR	0.1μF,50V
	C455	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C456	QFV71HJ-104	TF CAPACITOR	0.1μF,50V
		or QFN31HJ-104	M CAPACITOR	0.1μF,50V
	C457	QCVB1CN-103	CAPACITOR	0.01μF,16V
	C458	QEK61AM-226	E CAPACITOR	22μF,10V
	C459	QCVB1CN-103	CAPACITOR	0.01μF,16V
	L451	PU59152-270J	COIL	27μH
	CN451	PEMC0713-111	HOUSING	

SECTION 6
TECHNICAL INFORMATIONS

6.1 SYSTEM CONTROL CIRCUIT

6.1.1 Mechacon CPU pin function (IC601)

Pin No.	Symbol	I/O format	Label	I/O	Contents
1	Port 6 3	C-MOS	L/$\overline{\text{STEREO}}$/$\overline{\text{R}}$	O	AUDIO CHANNEL SELECT
2	2		HiFi/$\overline{\text{MIX}}$/$\overline{\text{NOR}}$		AUDIO MONITOR SELECT
3	1		DRUM DRIVE	O	SPECIAL PB H CORRECTION
4	0		CAP DRIVE		CAPSTAN MOTOR DRIVE VOLTAGE SERVO
5	Port 4 7	N-ch OPEN DRAIN	AVG FM	I	AUTO TRACKING DATA INPUT
6	6		S CURVE		AFC DET (TUNING CHECK)
7	5		THERM		THERMIC CORRECTION
8	4		CASS SENS		CASSETTE SENSOR (CASSETTE IN/OUT DET) ⎍
9	Port 3 7		REC SAFETY		DETECTS ERASE PROTECT TAB (TAB ABSENT: H)
10	6		TIMER CLK	I	TM (Timer/M-CTL CPU) bus 16 bit Serial Data
11	5		TIMER DATA	I/O	
12	4		MODE SENS B	I	MECHANISM MODE DETECT
13	3		MODE SENS A		
14	2		MODE SENS C		
15	1		CAP FG	I	MODE (SP/LP/EP) DETECT/BACK SPACE
16	0		CTL PULSE		MODE DETECT/BLANK DETECT
17	Port 5 7	C-MOS	START SENS	I	DETECTS LEADER TAPE (DETECT ON: L)
18	6		END SENS		DETECTS TRAILER TAPE (DETECT ON: L)
19	5		AUTO/MAN/SLOW	O	HEAD SELECT SIGNAL OUTPUT
20	4		V PULSE	O	V PULSE OUT (SPECIAL PLAYBACK)
21	3		DRUM FF	I	DRUM ROTATION DETECT, REC (EDIT) TIMING
22	CN Vss	—	CN Vss	I	ALWAYS GND
23	RESET		RESET		AC IN RESET
24	X IN		X IN	I	MAIN SYSTEM CLOCK (8 MHz)
25	X OUT		X OUT	O	
26	Vss		Vss	I	GND
27	Port 5 2	—	TU FG	I	REEL FG INPUT (ROTATION DETECT/TAPE REMAIN)
28	1		SUP FG		
29	0		DO CTL	I	DOC MUTE
30	Port 1 5	N-ch OPEN DRAIN	REMOTE PAUSE	I	REMOTE PAUSE CTL (PAUSE ON: L)
31	4		POWER $\overline{\text{ON}}$/OFF	O	POWER CTL (P. ON: L)
32	3		PICTURE MUTE	O	MUTE ON: L
33	2		VIDEO	O	VIDEO MODE: L
34	1		EE	O	EE MODE: L
35	0		TNR/$\overline{\text{AUX}}$	O	INPUT SIGNAL SELECT (AUX: L)
36	Port 0 7		REC START	O	REC START: L
37	6		SP	O	SP MODE: L
38	5		AUDIO MUTE	O	MUTE ON: L
39	4		HiFi REC START	O	REC START: L
40	3		LP	O	LP MODE: L
41	2		REC	O	REC MODE: L
42	1		SPX11	O	SELECTS MAXIMUM SPEED (SP$\overline{\times 7}$/×11)
43	0		SYNC DET	I	SYNC L/H FROM TUNER (NO SIGNAL: H)
44	Port 2 7	C-MOS	LOCK	I	TUNNING DATA OUTPUT CHECK
45	6		DATA	O	PLL TUNING DATA
46	5		CLOCK	O	CLOCK
47	4		S DATA	O	16 bit SERIAL DATA (SERVO CTL)
48	3		INDEX	I/O	INDEX DATA (VISS) WRITE/DETECT (ON: L)
49	2		CAP REV	O	CAPSTAN MOTOR DRIVE (REV MODE: L)
50	1		PAUSE	O	CAPSTAN MOTOR SERVO
51	0		SERVO	O	CAPSTAN MOTOR SERVO
52	Vcc		Vcc	I	Vcc (for SYSTEM CONTROL)

6.1.2. Timer CPU pin function (IC701)

Pin No.	Symbol	Label	I/O	Contents
1	D11/FS4	Se	O	SEGMENT DISPLAY DATA/KEY SCAN PULSE OUTPUT
2	D12/FS3	Sd	O	SEGMENT DISPLAY DATA OUTPUT
3	D13/FS2	Sc		
4	D14/FS1	Sb	O	SEGMENT DISPLAY DATA/KEY SCAN PULSE OUTPUT
5	D15/FS0	Sa		
6	R00/FD0	11G	O	COLUMN DISPLAY DATA
7	R01/FD1	10G		
8	R02/FD2	9G		
9	R03/FD3	8G		
10	R10/FD4	7G		
11	R11/FD5	6G		
12	R12/FD6	5G		
13	R13/FD7	4G		
14	R20/FD8	3G		
15	R21/FD9	2G		
16	R22/FD10	1G		
17	RF23/FD11	GRID END	I	LIGHTING DATA OUTPUT CHECK
18	RA0	$\overline{\text{TEST}}$	I	TEST POINT (CLOCK ADJUST)
19	RA1	P. DOWN	I	POWER DOWN DETECT
20	R30/FD12	IND ON	O	LEVEL IND CONTROL (IND ON: L)
21	R31/FD13	DIMMER	O	DIMMER CONTROL (DIMINUTION: L)
22	R32/FD14	POWER LED	O	LED CTL (LED ON: H)
23	R33/FD15	AUTO TR LED		
24	R50	NC	–	NC
25	R51	NC		
26	R52	NC		
27	R53	SAP REC		SAP REC: H
28	R60/INT0	11G	O	COLUMN DISPLAY DATA
29	R61/INT1	CNT PULSE	I	LINEAR TIME COUNTER DATA
30	R62/INT2	REMOTE	I	REMOTE DATA INPUT
31	R63/INT3	SYNC DET		SYNC L/H FROM ON SCREEN (NO SIGNAL H)
32	Vcc	Vcc	I	for SYSTEM CTL (MAIN POWER)
33	R40/SCK	OS-CLK	O	MEMORY DATA/ON SCREEN DATA
34	R41/SI	CS	O	
35	R42/SO	OS-DATA	I/O	
36	R43/PWM	PROG	O	PROGRAM MODE: H
37	R70/BUZZ	NC	–	NC
38	R71	TM CLK	O	TM (Timer CPU/M-CTL CPU) bus 16 bit SERIAL DATA
39	R72	TM DATA IN	I	
40	R73	TM DATA OUT	O	
41	R80	$\overline{\text{OS RESET}}$	O	ON SCREEN IC CONTROL
42	R81	OS CE		
43	R90	KS 0	I	KEY SCAN DATA INPUT
44	R91	KS 1		
45	R92	KS 2		
46	R93	KS 3		
47	RESET	RESET	I	AC IN RESET
48	OSC 2	OSC 2	I	MAIN SYSTEM CLOCK (4.194304 MHz)
49	OSC 1	OSC 1	O	
50	GND	GND	I	GND
51	CL1	CL1		
52	CL2	NC	–	NC
53	TEST	+5	I	ALWAYS 5V LEVEL
54	D0/FS15	Sp	O	SEGMENT DISPLAY DATA OUTPUT
55	D1/FS14	So		
56	D2/FS13	Sn		
57	D3/FS12	Sm		
58	D4/FS11	Sl		
59	D5/FS10	Sk		
60	D6/FS9	Sj		
61	D7/FS8	Si		
62	D8/FS7	Sh	O	SEGMENT DISPLAY DATA/KEY SCAN PULSE OUTPUT
63	D9/FS6	Sg		
64	D10/FS5	Sf		